Transforming Joint Air Power

The Journal of the JAPCC

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'Air is our strategic advantage but can become a strategic vulnerability if not employed with restraint and precision'
Gen Stanley McChrystal, COM ISAF in a letter to Chairman of Joint Chiefs of Staff on 24 Aug 2009.

There can be a tendency amongst airmen to believe that only they truly understand Air Power, yet these words show that our senior joint commanders comprehend both its value and its limitations.

Air Power is fundamental to ISAF campaign design; in their article, Gen Both and Col Jinnette describe the contribution of CAS and suggest that role realignment might better utilise platform versatility. In addition to ends and means, we must look at the ways; do we really still need to predominantly operate in pairs?

Unsurprisingly, examples from Afghanistan pepper this edition, including Wg Cdr Parkinson's article on the criticality of cultural understanding and Maj Peterson's examination of the parlous state of NATO expeditionary logistics. Yet, the picture is not entirely bleak as explained by Col Zazworsky in his article on Strategic Airlift Capability.

Given its primacy in the media, one might think ISAF is the only game in town. In LCDR Ehredt's article, he reminds readers of the strategic relevance of piracy to NATO in the face of limited and decreasing maritime air assets. Also on the maritime theme, Rear Admiral Treu illuminates the special relationship between naval aviators and their environments.

In the first of two space articles, Air Cdre van Hoof and Lt Col Single argue for investment in education; in the second, weaknesses in our current approach are exposed. This preparedness thread continues in Lt Col Delorey's fascinating article on cyberspace, where he asks 'Is NATO ready for Cyberwar?', and in Col Bickley's thought-provoking article on future threats to the Alliance. Future perspectives must be informed by the past and Wg Cdr Stansby urges us to tread cautiously in his article on Military History.

I am indebted to Lt Gen Meulman for his article on the contemporary issue of the Missile Defence Challenges for NATO – the Lisbon Summit may hold some keen insight. Finally, we are extremely privileged to have an interview with Gen Aksay, COM TURAF, who provides a fascinating insight into the past, present and future of one of the world's oldest air forces.

Before signing off – a plea. This Journal is nothing without its readership and I encourage your feedback, let us know what you like and don't like. Feel free to challenge the views expressed and let us know your opinion on these or any other Air Power or Space issue.

Paddy Teakle, Air Commodore, GBR AF
Assistant Director Transformation

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Please e-mail your manuscript as an electronic file to: articles@japcc.de

We encourage comments on the articles in order to promote discussion concerning Air and Space Power.

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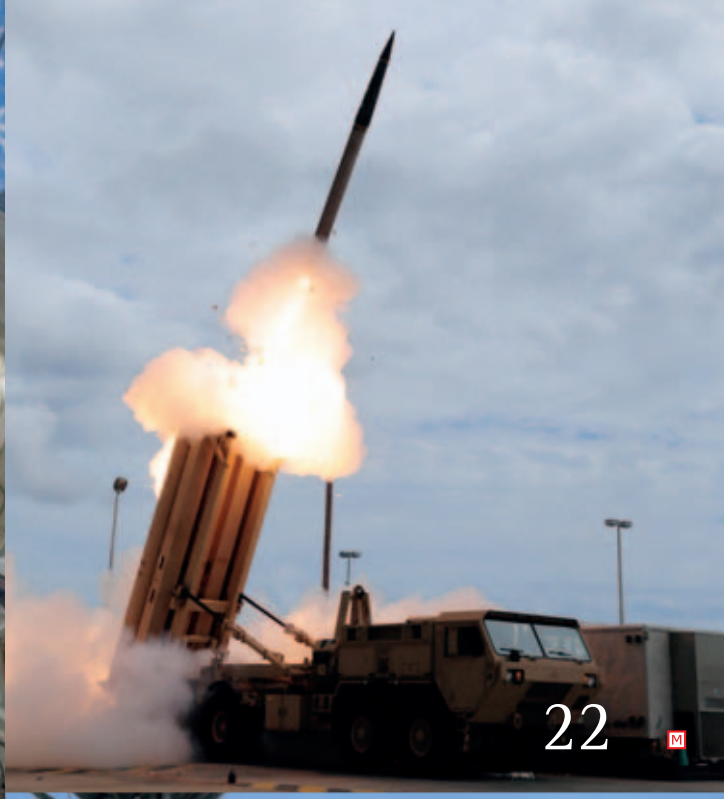
The Journal of the JAPCC Roemerstrasse 140 | D-47546 Kalkar | Germany



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Joint Air Power Competence Centre
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To find out more, access the JAPCC website at www.japcc.org.

M **Denotes images digitally manipulated**

Evolving to Meet Future NATO Challenges

An Interview with General Hasan Aksay, Commander of the Turkish Air Force

How would you assess the global and regional security situation around Turkey and the Air and Space (A&S) contributions of the TURAF to regional stability and ongoing NATO operations?

Turkey is located in a geography which is probably one of the most unstable regions of the world. This geography covers the Middle East, Balkans, and Caucasus. The existence of substantial energy resources in the region, and being at the crossroads of energy transportation routes, have greatly increased the significance of the region. Regional security is, therefore, very fragile and requires constant care and nurturing.

The TURAF has participated in NATO-led and non-NATO multinational operations, such as peace keeping operations in Bosnia Herzegovina and Kosovo. The TURAF is determined to be part of such operations in the future. NATO members currently play an important role and lead operations in Kosovo, Afghanistan, and Iraq. The TURAF is currently supporting all of these operations and missions by assigning numerous personnel to various command posts and staff jobs.

Furthermore, the TURAF maintains a small-scale immediate reaction force consisting of tanker and combat aircraft at the highest readiness level in order to quickly react upon NATO's discretion should crises arise anywhere in the world. I consider this as another contribution to global peace and stability.

I am a strong proponent of multinational exercises which increase understanding, cooperation, interoperability, and mutual trust among participants. For this reason, the TURAF takes active part in and hosts exercises, such as Anatolian Eagle exercises, among friendly and allied countries.

What are your thoughts on the challenges of A&S Power in a future security environment that may call for operations against hybrid threats?

There are several challenges A&S Power faces and will have to face in the future. Hybrid threats exhibit unpredictable behavior, vary in size and may appear on land, sea, air, space, and even in cyberspace. They are difficult to find, track, fix, and engage, especially in populated areas due to the high risk of collateral damage. One other worrisome fact is that the technology which helps us fight effectively is unfortunately available to a great extent to terrorist organisations as well.

The TURAF is constantly evolving its concept of operations and tactics in the wake of lessons learned from previous operations. Moreover, the TURAF is moving towards a more agile and flexible force structure able to act more quickly and effectively.

We are well aware of the fact that the security challenges are potentially boundless and resources are finite. But, whatever the challenges, the TURAF will always be ready to meet them. To do so, the TURAF is keeping its personnel and equipment at a high state of readiness.

Considering the constantly evolving security environment in which NATO operates, how would you prepare your airmen to meet these threats? How would you improve synergy with other components of military power, factoring in air and land integration?

Among the ever changing priorities and responsibilities, highly qualified personnel with moral and corporate values remains the number one priority for the TURAF. With this in mind, officers, NCOs, airmen, and civilian employees undergo a comprehensive training program throughout their careers.

Our overarching goal is to improve operational readiness across the entire Air Force. The blend of personnel, material and organisation is of special importance to us in order to achieve and maintain the required operational capability and readiness, but utmost importance is given to qualified and motivated personnel. Atatürk's 'The one who does not train at peace sheds his blood at war' is the motto of our training, evaluation, and inspection program. This program aims to check whether the force/unit meets the national and NATO force standards. Furthermore, our Flying, GBAD (Ground Based Air Defence) and ASACS (Air Surveillance and Control Systems) units are subject to NATO Tactical Evaluations in accordance with the TURAF's NRF (NATO Response Force) commitments and Defence Planning Questionnaire/ Order of Battle declarations.

The TURAF is quite aware that future wars cannot be won by only the Air Force, Army or Navy. Interoperability, cohesion, mindset, and the ability to operate together will be prominent to succeeding in wars and operations. In order to improve synergy with all components of military power, a number of activities are planned and executed every year. Examples include: Ephesus and Anatolian Eagle Exercises, courses to enhance interoperability among military services (TURAF, TUR Army and TUR Navy), and regular training provided to Joint Theater Air Controllers, Forward Air Controllers and Joint Fire Support Teams.

Could you elaborate on some of your capability development plans that would fill capability gaps within the full spectrum of A&S capabilities?

The TURAF continually transforms and improves its capabilities in parallel with its allies to meet the requirements of the future security environment. The goals of TURAF in this respect will be as follows:

- Increasing its capability to perform combined/joint operations together with its allies and other services;
- Having a highly capable professional manpower;
- Attaining a modern, deployable, survivable, and sustainable force structure;
- Establishing a reliable and sustainable C4ISR system;
- Harmonising high technology equipment and weapon systems;
- Developing and maintaining day and night all weather precision engagement capability;
- Establishing and sustaining network centric operations;
- Establishing joint and coalition interoperability; and
- Increasing space capabilities.

In order to meet our expectations, we have given priority to Airborne Early Warning and Control Aircraft,

F-16 modernisation, stand-off munitions, the New Generation Combat Aircraft, Unmanned Aircraft Systems (UAS) and space-related projects.

In line with our platform modernisation programs, we pay special attention to precision engagement. Recognising their major impact in future air operations, we plan to procure stand-off precision guided munitions. We are also interested in potential cooperative efforts towards the development of innovative munitions.

UAVs already have a special place in the combat area with their ability in surveillance, observation, communication, EW, and attack functions. Being aware of the significant role of UAVs, the TURAF has launched several UAV projects.

The TURAF has focused on force enhancement and force support aspects of space assets. The space systems we plan to acquire in the near future will integrate with terrestrial systems to provide a valuable set of tools for improving the surveillance, reconnaissance, early warning, navigation, weather and communications capabilities of defence organisations.

Missile defence is a broad concept including multiple systems working in a complex environment. Space-based early warning has a crucial potential in filling an important gap in ballistic missile defence. Such capability will serve both national and allied security. Our focus is on finding NATO partners with whom to establish cooperation that will integrate into or encompass our current national program.

The Joint Strike Fighter (JSF) program provides a good opportunity to replace an aging fighter fleet with a new generation combat aircraft. We expect to mark this project as a turning point for transformation.

How do you evaluate Turkey's position in the F-35 project?

Turkey is planning to follow the latest aviation technology by integrating the fifth generation aircraft into her operational power. The F-35 is a good candidate due to its mission systems, low observability and range.

The F-35 Lightning II Program has been developed on the experience, technology, and capability of 9 different nations. In order to enhance the success of the program, Turkey's existing technology and capabilities should be considered more deeply. For effective planning/execution/management of operations, we want to have uninterrupted logistics support, the maintenance/repair capability which is essential for the continuation of operation and the capability of integration of the systems and weapons developed in our country. Those are very crucial in our decision making processes for the New Generation Aircraft procurement.

We propose to integrate our cost effective systems and indigenous weapons to JSF. This will also serve the benefit of all JSF users. Additionally, I believe the capabilities such as Engine Final Assembly and Check-Out (FACO), Airframe and Engine Maintenance Repair, Overhaul & Upgrade (MRO&U) Capabilities, Calibration Capability for Selected Support Equipment and Regional Logistics Warehouse that will be established in our country will increase the logistics performance and will decrease the sustainment costs of the F-35 aircraft based in the region. I think we are able to present a robust solution to the increasing costs of the project.

The negotiations are being carried out with the U.S. government and the main contractor in order to gain the mentioned capabilities. However, no acceptable solution for the national requirements (electronic warfare, weapon and system integration, engine FACO and MRO&U capability) which will meet the vision of the Turkish Air Force has been reached so far. I hope that satisfactory progress on our crucial provisions will occur before May 2011 when the initial aircraft procurement decision will be made by the Turkish Authorities.

Due to their contributions to current operations and high expectations in future utilisation, UAS have taken on an important role in discussions concerning future capabilities within NATO. How does the TURAF plan to integrate UAS into its force structure?

Studies on the procurement of UAS were initiated several years ago to meet the TURAF's reconnaissance, detection, and identification requirements in a cost effective way. For this purpose, the national defence

industry was tasked to design and produce indigenous Medium Altitude Long Endurance (MALE) UAS while off-the-shelf solutions were being sought. The TURAF has almost finished procurement of ten MALE UAS called 'Observer-1 (Gözcü-1)' which are capable of conducting tasks on a 24-hour basis in all weather conditions. Although they were off-the-shelf, some modifications to the original design were applied, one of which was certainly the nationally developed targeting pod (ASELFLIR 300T), illuminating targets for Combat Aircraft and Helicopters.

Furthermore, we are intensely working on the Observer-2 (Gözcü-2) which will be designed and produced by Turkish Aerospace Industries Inc. Flight tests will start by the end of 2010. Studies for the procurement of weaponised UAS are currently underway. We are already working on concepts to integrate UAS with our strike capability. Releasing weapons from an unmanned platform is a complicated job on which we shall focus in the near future.

How will the TURAF introduce new capabilities to better position itself within the information age with respect to information management and airborne command and control?

The art of war dictates that one must obtain the required information in a timely manner and in a relevant way while the advantage still exists. In terms of gaining and maintaining the advantage, the speed of command always plays a critical role.

The TURAF has developed an information system that helps commanders in decision making. All services have been integrated into the TURAF Information System to have a common picture of the operational area.

Network Enabled Capabilities and Effect-based Approach to Operations are taken as a basis by the TURAF in order to meet the requirements of its mission in the best way. To achieve continuous and effective command, command and control architecture will be

Turkish fleet of F-16s at Konya Airbase.

strengthened with airborne platforms. It is still an ongoing process to procure contemporary C4ISR capabilities for the TURAF such as C2 aircraft, data link, AEW and satellite systems.

The TURAF, possessing such capabilities, will easily reach the desired level in the 'information era' and compete with other air forces in the command and control area.

As one of the earliest military air organisations, TURAF is planning to celebrate its 100th anniversary in 2011. What kind of activities are you planning for your 100th anniversary?

The honor and excitement of the 100th anniversary will be shared with our nation, as well as with the friendly and allied nations all around the world at the 100th anniversary activities. In this context:

- European Air Chiefs Conference will be conducted on 1 June 2011, and the Global Air Chiefs Conference will be conducted on 2 June 2011, both in İstanbul. Commanders attending these conferences will be the spectators for the International Air Show;
- The International Air Show on 4–5 June 2011 will be one of the greatest air shows performed in Europe and open to the public;
- Another activity is the Anatolian Eagle Training on 13–24 June 2011, in Konya. The training is planned to be conducted with broad participation from various countries;
- Recent Advances in Space Technologies Conference (RAST-2011) will be held on 9–11 June 2011. A military-scientific project contest with the theme 'imaging with a system which separates from a helium balloon' will be held in coordination with the Scientific and Technological Research Council of Turkey (TUBITAK). These activities represent the future vision of the TURAF: 'becoming one of the leading air and space powers in the world'.

The main theme of the International Defence Industry Fair 2011 will be the 100th anniversary of the TURAF and capabilities of the TURAF, which will be displayed in a specific stand at the fair. To recall the history of the Air Force to our nation and to our personnel and to commemorate our former Commanders and personnel who expended great efforts for the level we have reached, an International History Symposium under the name 'Turkish Air Force from Foundation to Today' will be conducted. 'Female Officers in the Turkish Air Force History' and 'Non-Commissioned Officers in the Turkish Air Force History' meetings and a historical uniform parade will also be organised.

Furthermore, a prestigious book on the TURAF, a historical documentary of 6 episodes, a television program of 12 episodes, and a 'drama' will be prepared. A cinema movie related to the lives of TURAF personnel will be a surprise for 2011. I believe it will also be popular internationally.

In addition, a march and symphony will be composed in memory of the 100th anniversary and a 100th Anniversary Monument will be erected in Istanbul. All these activities will be performed in line with the concept created by our motto 'Turkish Air Force Competes with the Age' and logo symbolising this.

Sir, thank you for your time and your comments.

General Hasan Aksay

holds degrees from the Turkish Air Force Academy, Air War College and many educational courses in-country and abroad. He has served as pilot in various types of fighter aircraft, as commander of fighter units, and as Chief of Plans and Operations, where he gained vast experience in many national and international air operations at all levels. As a Lieutenant General, he served as Air Training Commander, Commander of the 1st Air Force, Chief of Inspection and Evaluation, and Chief of Staff. Upon promotion to General, he assumed command of all War Colleges and then became the Commander of the Turkish Air Force in 2009. Today, with more than 5000 flight hours, he still preserves his fighter pilot spirit as a certified F-16 pilot.

Naval Air Power – The Italian Navy Vision

By Rear Admiral Paolo Treu, ITA N, Italian Fleet Air Arm Commander

Maritime Power is a 'National Power,' an expression of a host of capabilities which are not only military, but also political and economical. Maritime power is aimed at optimising the employment of all capabilities that a Nation can project on the sea and from the sea. These capabilities, as far as Italy is concerned, are to provide security while supporting progress and prosperity on a national and international level. Naval Air Power, exercised by the Italian Navy, is a key pillar of Italian Maritime Power.

Strategic Concepts

Two strategic concepts have been identified: 'Integrated Maritime Surveillance' and 'Projection of Capabilities on the Sea and from the Sea.' In both 'Surveillance' and 'Projection' concepts, the role of the embarked aircraft, considered the long arm of the fleet and a force multiplier, is fundamental and allows the classical characteristics of Air Power to combine with those of the Naval Instrument, giving Naval Air Power capabilities of extraordinary value that are unparalleled.

'Integrated Maritime Surveillance' is made up of different activities by ships, submarines and aircraft, such as patrolling, monitoring and presence within the areas of interest. These activities are conducted in cooperation with other agencies and organisations at national or international levels. 'Projection of capabilities on the Sea and from the Sea' is made possible by the peculiar characteristics of the Naval-Air Instrument, which include: strategic versatility, logistic autonomy, operational flexibility and inherent interoperability among its components.

AV8B Harrier II Plus:
Power protection on the sea and from the sea.

Dialogue and Cooperation

The expression 'Dialogue and Cooperation' acts as a catalyst for Strategic Concepts, as well as an initiative for international collaboration; an example is the STOVL (Short Take-Off Vertical Landing) Carrier Training Initiative. This initiative was launched in view of the strategic relevance of the STOVL Carriers, but acknowledged budgetary constraints and other factors limiting their availability. This initiative aimed to boost interoperability through cross-training activities, where aircraft of one nation operated on board a carrier of another nation, thereby maximising the utility of all available assets. Currently, all NATO Navies operating with STOVL aircraft (France, Spain, United Kingdom and United States) participate in the initiative.

The Aircraft Carrier's Impact

The Aircraft Carrier is emblematic of a Nation's international rank. It represents the maximum expression of Naval Power and Naval Diplomacy and is the reference platform for the Sea Basing Concept, which is the capability to build up an advanced base in the open sea and is made up of a mobile and versatile group of ships that can also be employed by other Armed Forces.

The Carrier is sometimes the only military instrument that can be employed during the initial phases of an operation, taking advantage of the following prerogatives:

- freedom and vastness of the seas; the right of inoffensive crossing of international waters and straits, which allows the possibility to reach almost any area of potential crisis, taking into account that the earth is covered mostly by water and that a major portion of the population lives within 100 miles of the sea;
- the capability to operate in the absence of a host nation, taking advantage of the great logistic autonomy of the carrier, which is further extended by its capability of replenishment at sea;
- her advantages of being an advanced mobile air base capable of limiting the impact of fatigue on men and aircraft, due to its proximity to targets;
- conducting flight operations with maximum safety, being less vulnerable to incursions and terrorist attacks, compared to an airport in a country near the area of crisis;
- making flight operations less visible to enemy eyes, thus ensuring covertness;
- her specific characteristics as a mobile command center, capable of remaining close to the area of crisis or conflict, thus optimising the decision-making process with greater benefit for flexibility, promptness, and the effectiveness of military action;
- her excellent versatility, which allows decision makers at a political level to finely calibrate diplomatic or military actions in order to optimise the management of a crisis or conflict, with the option of

increasing or decreasing military pressure with much greater flexibility compared to the employment of troops on the ground;

- the possibility to positively influence the outcome of a crisis through her presence, leveraging her deterrence.

Most of these capabilities are also highly effective for intervention in the event of natural disasters requiring humanitarian assistance. For example, the Italian Navy's Carrier *Cavour* – with 6 heavy helicopters and a Joint Intervention Team – left Italy for her first mission within Operation White Crane, supporting the Haiti population after a deadly earthquake had struck their country.

The Strength of Organisation

One of the strengths of Italian Naval Aviation results from the dual-hatting of the Head of the Naval Aviation Department of the Navy Staff and the Commander of the Fleet Air Arm, who is the force provider for the fleet. This organisation puts into action the concept of Total Capacity Management, which converges operational responsibilities with those pertaining to the employment of assigned financial funds, the management of sectors related to studies, new programs and procurement, technical and operational evaluation of systems and means, formation, publications and flight safety, and of course, personnel.

This pioneering concept of organisation has contributed significantly to the progress of the Naval Air Component, imposing an aggressive rationalisation of human and material resources, and a great focus on effectiveness and readiness of personnel and aircraft. Moreover, this organisation, which is absolutely vital due to Italy's present budget constraints, applies well to elite components, where quality prevails over quantity, and where the central decision-making core is in close contact with squadrons and other components, deployed in operational theatres, onboard ships or ashore.

In the wake of our cultural heritage, personnel are considered the primary resource, while respect of traditions, safeguarding values and preservation of our identity support the evolutionary thrust to preserve and boost the capabilities of the Naval Air Component in line with a long history of shipboard operations. It is worth mentioning that 100 years ago, an Italian Navy Officer, Lieutenant Mario Calderara, earned the first Italian Pilot License.

Another facet of strength can be seen in the dignity shown by all personnel, regardless of rank, role or flight line assignment. The overall organisation acts as a clock, with gears performing different functions, but all equally essential to its operation. The overall result is the motivational impulse, or sense of duty and spirit of belonging, but also the solidarity and the humanity that distinguish the men and women of the Italian Fleet Air Arm. These men and women find their strength in belonging to a crew, in having the dual vocation of the sea and the sky, and in the application of the naval culture to the air business.

Target Point

Naval Air Power plays a key role in Italy's two strategic concepts of Maritime Power: Integrated Maritime Surveillance, and Projection of Capabilities On the Sea and From the Sea. Their success lies in the belief that the members of Fleet Air Arm are sailors first, because their full integration into ship's company is seen by the Italian Navy as crucial to conducting effective, efficient, and safe operations in the maritime environment.

Italian Naval Air Capabilities

Despite the budgetary constraints Italy is facing, the Fleet Air Arm – with only 2,200 people and 77 aircraft (57 helicopters, 17 Harriers and 3 P180 aircraft), and a ratio of maintainers to aircraft of 9 to 1 – is capable of producing 16,000 flight hours per year and ranks among the best in the world in terms of its flight safety record.

Helicopters (the Agusta Westland EH101, Sikorsky SH3D and Agusta AB212) are employed for Anti-Submarine and Anti-Surface Warfare (ASW), Early Warning (EW), Maritime Patrol, Amphibious and Maritime Assault, Support to


© Italian Navy

The Italian Navy EH101 fulfils several roles: ASW, ASuW, EW, PR and SPECOPS.

Special Forces, Combat Search and Rescue, Close Air Support, Evacuation, MEDEVAC and Logistics Support. The Harrier AV8B PLUS is employed as a multi-role tactical aircraft for Anti-Air Warfare, Anti-Surface Force Air Operations, with great capabilities in Close Air Support, Target Acquisition, Intelligence, Surveillance and Reconnaissance.

Starting this year, the NH90 will replace the AB212. Italy plans to acquire 46 naval helicopters in the Anti-Submarine and Anti-Surface configuration, along with 10 in the Maritime Assault configuration, to compensate for the decommissioning of the SH3D in 2011. Starting in 2014, 22 Joint Strike Fighters, with STOVL capability, will progressively replace the AV8B PLUS – propelling the Italian Navy into the 5th generation fighter era. Additionally, Italy is in the process of acquiring Unmanned Air Vehicles, both fixed and rotary wing, in order to fulfil the requirements of an operational environment with rapidly increasing challenges.

Conclusion

Since its origin, the Italian Navy has considered aircraft to be an integral part of a ship's capabilities and not an autonomous entity. The personnel assigned to the squadrons, when embarked, are completely embedded in the complement of the ship and each individual has specific tasks on board, participating as members of various safety and emergency response teams. Crew members and maintainers of the Italian Fleet Air Arm are sailors first, and this status allows each individual to perform effectively in the constrained ship environment. Full integration of the Fleet Air Arm in the ship's company is crucial for newer ships, where the crew is half the size compared to units of the former generation. This situation demands that all embarked Fleet Air Arm personnel must be capable of performing tasks that go well beyond air operations. We can see this synergy displayed with our new Carrier *Cavour*. Italian Naval capabilities have been further enhanced by this force multiplier, which is able to act as a general headquarters at sea for joint and multinational operations and capable of conferring great effectiveness to the fleet during early entry force operations, in cases of crisis or conflict. Both personnel and aircraft operate in accordance with multi-role criteria in order to attain maximum effectiveness of resources. It is this special bond that integrates the personnel of the Italian Fleet Air Arm, complementing the ship and 'melting the aircraft into the iron and steel of the ship'. This allows the Italian Fleet Air Arm to ensure maximum operational output in the complex maritime environment, while maintaining high flight safety standards. ●

Rear Admiral Paolo Treu

graduated with high honours from the Italian Naval Academy in Maritime and Naval Science in 1981. In 1983, he earned his U.S. Naval aircraft and helicopter wings. He served as Commanding Officer of Mine Hunter Milazzo, Harrier Squadron 'GRUPAER', Frigate Espero and Aircraft Carrier Garibaldi. His flight experience includes helicopters (UH1, TH57 and AB212) and aircraft (T44, T2, A4, AV8B and AV8B PLUS). He served as Chief of Staff of the Command of the Fleet Air Arm (2002–2004) and Executive Assistant to the Chief of Staff of the Italian Navy (2006–2008). He was promoted to Rear Admiral (LH) on 23 March, 2007 and appointed Director of the Naval Aviation Department of the Italian Navy General Staff and Commander of the Italian Fleet Air Arm in 2008.

© NATO

A 12-Nation dream becomes reality. Col Zazworsky, Heavy Airlift Wing Commander, and Brig Gen Rich Johnston, Strategic Airlift Capability Steering Board Chairman, unfurl the wing colours for the first time at the activation ceremony on 27 July, 2009.

Strategic Airlift Capability:

C-17 Multinational Airlift Takes Flight

By Colonel John Zazworsky, USA AF, Commander, Heavy Airlift Wing

Introduction

The idea of Strategic Airlift Capability (SAC) was first presented only four years ago. Since the signing of the Letters of Intent (LOI) in September 2006, the pace of the program has been incredibly fast. Not only have the twelve participating nations established the SAC Consortium to provide the strategic airlift capability to all partners, but they have also established the operational arm of the program, the Heavy Airlift Wing (HAW). Even though successful airlift operations have been underway for over one year, the HAW is still building toward Full Operational Capability (FOC). As this breakthrough initiative matures, the partner nations look to the future, confident that this still-maturing effort can serve as a model for similar cooperative efforts in other missions.

Background of the SAC Program

The participating nations of the SAC consortium, which include ten NATO nations of Bulgaria, Estonia, Hungary, Lithuania, the Netherlands, Norway, Poland, Romania, Slovenia, the United States and two Partnership for Peace (PfP) nations Finland and Sweden, signed a Memorandum of Understanding (MOU) on 24 September 2008 to acquire three Boeing C-17 Globemaster III long-range cargo jets. According to the MOU, each SAC participating nation pays for a portion of the aircraft, supporting infrastructure and operating costs, allowing the nations to share a pooled fleet. Each nation's share of the budget is proportional to its share of the flying-hour potential of the HAW. The MOU will remain in effect for 30 years, the anticipated lifetime of the three aircraft.

SAC aircraft acquisition, management, and support is achieved through the NATO Airlift Management Organization (NAMO), a NATO Procurement, Logistics or Services Organization (NPLSO) established by the North Atlantic Council (NAC) on 29 September 2008. On behalf of the 12 SAC Nations, NAMO owns the aircraft and other related equipment, with oversight provided by a 12-Nation Board of Directors. SAC has also joined the C-17 Globemaster III Sustainment Partnership, which provides support to all C-17s in service around the world.

© U.S. Air Force

A C-17 makes the HAW's first landing at Baghdad International Airport, Iraq.

The uniqueness of SAC comes from the multinational composition of the HAW, which operates the aircraft. Although SAC relies on certain NATO support structures, it transcends military and political alliances like NATO and the EU. For example, NATO or any other international organisation cannot directly task the HAW, but they can request support through one of the participating nations. The authority lies with each of the participating nations who decide how they want to allocate their flight hours each year. Program oversight is provided by the twelve-nation Steering Board, and operational control rests with the HAW Commander. The missions are planned by HAW's Command and Control branch according to the urgency and priority of the requests. In case of conflicting requests the HAW Commander makes the final decision.

Target Point

The Strategic Airlift Capability Consortium has resolved significant airlift shortfalls for many of the 12 Nations involved in building this bold initiative. By translating this model of multinational cooperation to fulfil other capability gaps, NATO can apply the lessons learned to other missions, such as air-to-air refueling and personal recovery. The successes of the Heavy Airlift Wing will be followed for years to come.

From Activation to Operations

As the operational arm of SAC, the HAW began work on 6 October 2008, when the first airmen from the participating nations began their work at Pápa Air Base in Hungary. With the support of the host nation and NAMO, the multinational personnel built the new Wing literally from scratch. In addition to these airmen, the baroque town of Pápa has experienced an influx of new residents as the families of the HAW, NAMO and Boeing contract maintenance personnel have moved into their new hometown.

The pace of the build-up phase of the HAW was rapid and multi-faceted. There have been many milestones on the way: the training of the multinational personnel to meet the high standards required for operating C-17s, the certification and the registration of the aircraft, establishing diplomatic clearance procedures, delivery of three C-17s during the summer and autumn of 2009, airlift and air-to-air refueling operations on the very first mission, and formal activation on 27 July 2009 with distinguished visitors from all participating nations.

This unprecedented pace has now been underway for less than 2 years. During that time the airmen from twelve nations with different aircraft and military backgrounds have been molded into a combat-ready team capable of conducting worldwide operations. Since flight operations began in July 2009, HAW aircrew and aircraft have already flown over 2000 flight

hours delivering over 4200 tons of cargo and over 3300 passengers. While the majority of the missions have been in support of troop and equipment rotations to three combat AORs, the HAW has also demonstrated its maturing capability through rapid response to contingencies, delivering earthquake relief to Haiti and supporting Poland in repatriating the victims of the Smolensk, Russia air tragedy. With the intention of preparing to employ the full operational flexibility of the C-17, HAW crews are qualified in all mission areas: air land, air drop, air-to-air refueling; and operating from short, austere airfields.

Future Challenges

While the HAW has conducted successful flight operations, the SAC program has more effort remaining to reach FOC. One area is upgrading flight personnel to full qualification and certification of additional aircraft commanders to provide more crews and full productivity from the aircraft. Steady progress continues in this area, with pilots, loadmasters and flying crew chiefs following the same training syllabi and progressing at the same rate as their U.S. Air Force C-17 counterparts. A second area of effort is the improvement of host base infrastructure to convert the former MiG fighter base into an airlift hub. Interim office spaces have been created from a soldier dormitory and the parking ramp has been modified to properly service and load/unload the aircraft, but important future projects lie ahead: a hangar to expand on-site maintenance capability, an air terminal to expand cargo and passenger handling capabilities, and a headquarters building for office activities.

Future Potential

While the HAW matures toward FOC, SAC partners have an eye on the future, confident that this concept will attract other nations with similar airlift requirements. Interested nations may contact any member of the SAC Steering Board, who will provide more information about SAC partnership. Once a nation has formally declared interest as a Prospective Participant they may, upon Steering Board approval, attend meetings but have no decision authority. NATO & PfP nations can join the SAC program by unanimous vote of the SAC Steering Board & the NAMO Board of Directors, followed by an MOU Amendment signed by all Participants accepting the new member.

Conclusion

Although still maturing, the SAC program is tangible evidence of nations' will to work together to field capabilities relevant to the challenges of today's security environment. By working together, pooling resources and fairly sharing cost burdens, SAC nations now have access to strategic airlift capability that would be difficult to acquire on their own and have achieved greater efficiencies than are possible individually. The HAW and its C-17 fleet have already become a key enabler for national, NATO and EU 'out of area' operations. Even at this early stage of the program, the lessons learned in defining and establishing SAC are directly relevant to future cooperation between nations in owning and jointly operating other defence capabilities. ●

Colonel John Zazworsky

has been an air mobility pilot since 1984, operating the C-17A, KC-135R, C-37A, C-141B and C-12C, and has flown in support of OEF, OIF, KFOR, and combat operations in Somalia and Panama. He has commanded at the squadron, group and wing levels, including deployed command of an expeditionary squadron at Ramstein AB, Germany, conducting C-17 humanitarian relief air drop missions in OEF, and an expeditionary group at Incirlik AB, Turkey, conducting C-17 airlift and airdrop and KC-135 air-to-air refuelling missions in OEF/OIF. His group command oversaw the transportation of United States senior civilian and military leaders. His staff tours include the Joint Staff J-3 Operations Directorate, Counternarcotics Division, and the European Command J-5/8 Strategy, Policy and Assessments Directorate, Arms Control Compliance.

Special thanks to the Heavy Airlift Wing Public Affairs Officer, Captain Juha Miettinen, Finland Air Force, for assembling the material forming the basis for this article.


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Army astronaut Col Tim Kopra manoeuvres himself within space shuttle Endeavor's cargo bay.

Integrating Space – People First!

By Air Commodore Jan van Hoof, NLD AF, JAPCC;
Lieutenant Colonel Thomas G. Single, USA AF, AFSPC

Introduction

For the last two years, the JAPCC has taken a lead role in identifying deficiencies concerning the Space mission area within NATO and identifying what is needed for the future. During this period JAPCC staff members have been fortunate to participate in many different NATO and international forums. These have demonstrated that the biggest obstacle to overcome in integrating Space capabilities within NATO is the lack of understanding and awareness of the importance of Space. Space offers tremendous advantages and capability, and if NATO and the Nations want to move forward and integrate Space into 'daily business', it must focus on 'people first!'

The JAPCC identified 5 interrelated elements to be addressed if we are to better integrate Space and Air operations.[1] The 'people first' approach to developing Space expertise focuses on the first two elements: education and training; and personnel.

Why we need to do something different

Our political and military cultures are such that personnel are trained and educated in a specialised field, rise through the ranks with increasing responsibility, and may finally hold positions of significant influence without ever gaining an understanding of other areas. During the Cold War, this system produced Land, Maritime and Air Power specialists. This

worked because personnel operated primarily within their own domains. More recently, the importance of Joint warfare has driven our education, training and personnel systems to adopt a more integrated approach. Today, global connectivity, along with the changing nature of warfare, requires a comprehensive approach in order to be successful. This relies on more coordination and places increased demands on our leaders and personnel.

The very nature of Space systems has also contributed to the current dilemma. Until recently, Space systems were typically developed as highly classified programs and were only available to a few nations. Space Power failed to develop in NATO because it was developed in (bi-) national 'stovepipes' to support a specific mission area. Space technology and availability has significantly advanced in recent years with the result that more and more nations (not to mention commercial providers) have now joined the 'Space Club' – further complicating coordination. Also, satellites typically have global coverage and are strategically important; therefore, they are rarely assigned as a National contributor to theatre assets.

To compound the problem, Space capabilities are a Joint enabler supporting multiple mission areas. Should this fall under a NATO Air component, or under a separate 'Space' component? Often prime responsibility has not been assigned to anyone at all. Most NATO Nations do not have military Space systems and might wrongly perceive that there is no requirement for military Space specialists. This has led to a lack of advocacy and an uncoordinated approach to Space at political and senior military levels. Unity of effort at the political and strategic level is always challenging, but without the benefit of Space expertise, it will be even harder to make appropriate Space decisions. Personnel, training and education must be addressed across NATO for Space to succeed as an operational capability and to support NATO objectives.

Personnel

Personnel with Space expertise are needed at the Strategic level to provide advice to senior leaders. At the operational level, expertise is needed across a broader range of specialities to integrate Space into plans and operations. Positions should include senior Space advisors, technical advisors, staff officers, operational planners, and Intelligence personnel with Space specialisations. Even where they do not operate their own Space assets, all Nations today can access Space capabilities through established NATO, EU and ESA relationships. Therefore, each Nation (and NATO) should have a Senior Space Advisor for both civilian and military matters, capable of addressing policy, strategy, cooperation and integration matters at the National level. Given its importance, it is perhaps surprising that there are fewer than ten Space staff positions in NATO today, none of which are above the rank of Lieutenant Colonel.

Target Point

The biggest obstacle to integrating Space within NATO is the lack of understanding and awareness of the importance of Space. At the operational level, expertise is needed across a broader range of specialities to integrate Space into plans and operations. A central Space Office at NATO HQ is recommended by the JAPCC as the first step to effectively integrate Space into NATO.

A Space specialist career path could be established. There are many issues to be addressed when establishing Space specialisation. First, what is the role of a Space specialist in NATO; what do we need this person to do? Some areas of consideration would be the integration of Space across other components and mission areas, such as Electronic Warfare Operations (EWO). Second, who should look at threats, vulnerabilities, and offensive/defensive space activities? In order to answer this question, we could pursue the integration of Space into the CAOCs, embedding these personnel throughout the force structure through the creation of mobile Space teams. Third, what backgrounds do we recruit from and how will personnel be developed and managed? It will be important to identify what background, education and training requirements are needed for each new position. While this may seem difficult and costly, there are many existing NATO

programs that can be leveraged to educate and train Space specialists. To this end, the JAPCC recently provided recommendations on the creation of new positions in ACT, ACO and other headquarters, including the establishment of a Space Office.[2]

Education & Training

The Nations are responsible for the training of their forces; NATO is responsible for training its headquarters and staffs. Therefore, Nations must accept their responsibility for educating and training Space specialists. These specialists must be well-versed in the diverse Space mission area; moreover, they must understand the complexities of Space supporting a myriad of mission types, such as Air Defence, Missile Defence, Special Forces, counter-piracy, and threats to Space systems. Further, these specialists require an intimate understanding of how Space capabilities can be tasked and information disseminated. For example, Coalition Space Teams (CSTs) are needed to bring together (in a holistic manner) the Space capabilities to better support Intelligence, Operations and Communications functions and provide assured access to those Space services. The development of CSTs should be a high priority for NATO in order to better support International Security Assistance Forces (ISAF) and Kosovo Forces (KFOR).

To begin developing Space expertise, NATO will need to develop and communicate clear education and training objectives. It must decide where and how many specialists are needed. Specialists are needed at different levels and will require basic and advanced knowledge. Therefore, Space topics should be integrated throughout basic and advanced military education programs, from undergraduate to post-graduate level and also at military academies and staff and war colleges.

Some positions will also require more advanced academic studies in Space. In the United States, several universities offer graduate degree programs in Space studies: the University of North Dakota, Webster University, the Naval Postgraduate School, the Air Force Institute of Technology, to name but four. Excellent programmes in International Space Policy Studies are offered at both the George Washington University Space Policy Institute and International Space University in France.

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Before Space can be integrated into exercises and operations, personnel need to be trained. Space training is currently available at the NATO School, and Space courses have been developed by Canada, France, Germany, the UK, and the U.S. At the moment, NATO lacks an executive level course, introductory course or a specialised course for Intelligence personnel. The expertise currently exists to develop these courses, but the challenge is to mobilise senior leaders to step-up the education and training effort and to overcome the lack of advocacy for Space.

Need for a NATO Space Office

We propose two possible approaches for NATO and each of the Nations to achieve the effective integration of Space. The first option is to integrate Space into the existing headquarters and force structure. As NATO is a large and complex organisation with many committees, working groups and offices, educating personnel in all of the various staff structures is not feasible. The creation of a central point for Space expertise is the second option with, we feel, a much higher chance of success. This could be accomplished by establishing a Space Office at the NATO Headquarters.

A NATO Space Office (NSO) would enable better decision-making by planning and integrating NATO and National capabilities, developing a Space architecture and working with Space partners. It would provide the vision, analysis and leadership to guide the Alliance on Space issues. This office could also provide consultation and technical support across the Alliance for the development of policies, agreements and capability requirements, such as developing a NATO Space Policy, Strategy and Road Map.

To provide executive oversight, an NSO would need sufficient authority and be established as a permanent entity. This would require a mix of civilians (for continuity), as well as military officers – including Space experts. The NSO might consist of 5 divisions: Policy and Strategy, ISR, Space Assurance, Architecture and Integration and Force Development. The Force Development Division would be responsible for the issues raised in this article: personnel, education and training. The NSO, as a permanent focal point at NATO HQ level, would provide support for all existing entities in NATO.

Conclusion

The concepts raised in this article should be considered by NATO and Nations. It is our belief that, looking at the growing dependence on Space, it is now time to act. There is no use waiting for formalised policy before we move ahead. We can build a firm base to carry Space to its required maturity starting with the education and training of our personnel. ●

1. These were identified in the JAPCC Journal Edition 10 article 'New Horizons: Improving Space Integration for NATO Air Operations.'
2. Ibid.

Air Commodore Jan A.H. van Hoof

of the Royal Netherlands Air Force, started his military career in 1975 at the Royal Military Academy in Breda. His first assignment was as ground defence officer to the 5th Air Defence Missile Group in Germany. In 1992, he graduated from the Dutch Air War College, followed by staff tours in the Plans and Policy branches at the Royal Netherlands Air Force Tactical HQ and at MOD-level. In January 2003, he was appointed Dutch Patriot Missile Battalion Commander at De Peel Airbase. From September 2004 – February 2005, he set-up and headed, as part of the ISAF-mission, the first Dutch Provincial Reconstruction Team (PRT) in Afghanistan. This operational tour was followed by the assignment as Deputy Director of Operational Policy at the Ministry of Defence. He is currently Assistant Director Capabilities at the NATO JAPCC.

Lieutenant Colonel Tom Single (BS, MBA, MS)

currently serves at the HQ Air Force Space Command Space Protection Program as the Chief of the Strategy Division. His operational experience includes ICBM, Space, and Air and Space operations centre weapon systems. In his previous posting, he served at the JAPCC and deployed to the ISAF Joint Command in Kabul as the Chief of Space Operations. He has participated in Joint and combined operations and exercises in the U.S. Central Command, U.S. European Command, and U.S. Pacific Command and has served in an array of Space officer capacities. An internationally recognised expert, Lt Col Single has served as an invited guest speaker at numerous international events and has authored several articles on NATO and coalition Space operations.

The Terminal High Altitude Area Defense (THAAD) missile defence element launching a successful intercept of a ballistic missile target.

Challenges for NATO Missile Defence

By Lieutenant General Freek Meulman, NLD AF, Dutch Military Representative to NATO

'Victory smiles upon those who anticipate the changes in the character of war, not upon those who wait to adapt themselves after the changes occur.'
Italian Air Power Strategist Giulio Douhet

Introduction

On 17 September 2009, U.S. President Barack Obama announced his Phased Adaptive Approach for Missile Defence in Europe; an ambitious plan to implement a defence system against short-to-

medium-range ballistic missiles using existing systems such as: the Standard Missile-3; Theatre High-Altitude Area Defence; and Patriot PAC-3. The aim of the Phased Adaptive Approach includes the protection of 'U.S. deployed forces, their families, and Allies in Europe'. The plans are thus targeted not only at American interests; they involve European interests as well. The plans also suggest that there will be cooperation with the European Allies to integrate the Phased Adaptive Architecture with missile defence capabilities of NATO members, and possible integration with the NATO Command and Control (C2) network for Theatre Ballistic Missile Defence operations.

A European Missile Defence Initiative

Europe can only be successful in Missile Defence if Nations look ahead and pro-actively participate, in action and thought, in the steps the U.S. has taken with the introduction of the Phased Adaptive Approach. Europe must not wait for America to take the next step, and only then think about the possible contributions it can make. European nations should determine from the earliest stages of the Phased Adaptive Approach what their contribution can be and how to promote a Missile Defence Architecture in the European theatre. This calls for a *European Missile Defence Initiative*. A number of preconditions must be met, however, before a European Missile Defence Initiative can be put into place.

First of all, there must be political will, which is the key foundation of any political decision. NATO is made up of 28 separate countries, some of them members of the European Union, some not. Each Nation makes an individual and autonomous decision, so the development of a common NATO Missile Defence capability is dependent on a large number of separate political decisions. Thus, a collective decision on Missile Defence is not imminent. Here, the solution may lie in a pragmatic approach.

Results could be achieved sooner through collaboration amongst a smaller group of willing and able NATO Nations, while simultaneously conducting an open dialogue with remaining European countries. The C-17 Strategic Airlift Capability is a good example of such an initiative. European and non-European NATO partners, as well as two European Partnership-for-Peace nations, are participating in this program. This concept of cooperation amongst smaller groups of countries could serve as a model for a future European Missile Defence initiative.

Secondly, military capabilities are needed, not just the hardware and personnel, but also Doctrine, Concepts of Operations, Tactics, Techniques and Procedures (TTPs), and training and exercise opportunities. An essential component of military capabilities is C2. NATO is currently building an Active Layered Theatre Ballistic Missile Defence (ALTBMD) system, where the C2 system for Missile Defence would be woven into the NATO Integrated Air Defence System (NATINADS) through the NATO Air Command and Control System (ACCS).

Thirdly, financial commitment is required. Missile Defence is technologically very complex, and therefore, costly. To ensure maximum efficiency and effectiveness, we need to assess whether existing systems and programmes, such as the NATO ACCS, can be leveraged. An additional advantage of building on existing systems is that one also has a broad knowledge base at one's disposal. That knowledge base would be useful for resolving the political and military issues that arise prior to and during the possible development of a Missile Defence capability in Europe.

Meeting the Challenges

When addressing the challenges in Missile Defence, Europe should adopt an all-encompassing and integrated approach. Good communication between the strategic, operational and tactical levels of warfare is essential as outcomes of issues at the operational level will have an effect on the tactical and strategic levels, and vice versa. Eventually, the outcomes at the various levels must be merged into a common Missile Defence agenda, which in turn should lead to an integrated roadmap.

A possible solution lies with NATO Nations taking steps to make progress on this matter, so that Europe will be prepared for the Phased Adaptive Approach.

This can be done by using existing structures within the Missile Defence community. The Missile Defence-related projects discussed below would be ideal building blocks for a European Missile Defence initiative.

Target Point

Since the announcement of President Obama's plan for a Phased Adaptive Approach for Missile Defence in Europe, a European Missile Defence Initiative has become a necessity. Europe can only be successful in Missile Defence if Nations look ahead and proactively participate. Building blocks for European Missile Defence, such as Nimble Titan and Joint Project Optic Windmill, are discussed.

Nimble Titan

Nimble Titan is a series of workshops and war games, during which political and military-strategic missile defence issues are addressed for future operations up to the year 2020. In Nimble Titan, political and military-strategic issues are approached within an experimental setting. The issues dealt with include:

In the political-strategic sphere:

· Political guidance;
· Legal consequences;
· Guidance on how to deal with consequences of intercept;
· Political-Military consultations and Political-Military C2 constructs.

In the military-strategic sphere:

· The translation of political guidance and legal consequences into military guidance including Rules of Engagement, and Weapon Release Authorities;
· The development of Operational C2 structures;
· The development of Doctrine including guidance for Mission Planning.

During the most recent Nimble Titan exercise, the exchanges of opinions between the various political and military players led to progress on a number of complex issues. Constructive political-to-military consultations are essential to sound and powerful conflict management. Dialogue between political and military leaders has been at the basis of the current development of a doctrine document, which should eventually lead to a consolidated Missile Defence Concept of Operations.

Joint Project Optic Windmill (JPOW)

JPOW's focus is oriented towards the integration of the Operational and Tactical levels, as well as exercising the overall Layered Missile Defence concept of Ground, Air and Sea-based Missile Defence. JPOW acts as a testbed of many new developments on weapon, sensor and information systems and contributes to a better understanding of Joint and Combined Interoperability.

JPOW is a logical follow-up to Nimble Titan due to the natural connection between the Strategic and Operational levels. There is also a link when it comes to the application of simulators and real systems. Nimble Titan uses low-fidelity simulation, which is sufficient for dealing with Strategic issues. JPOW uses high fidelity simulation techniques in combination with real missile defence systems.

By having JPOW begin where Nimble Titan ends, and by having representatives from the political domain participate, the strategic lessons drawn from Nimble Titan can be put into practice. Doctrine and concepts developed during Nimble Titan can be evaluated and validated, and subsequently refined and elaborated in detail as TTPs. Where Nimble Titan concentrates on the long term, JPOW must keep its focus on the near future.

Special Project Optic Windmill (SPOW)

SPOW is an Integrated Air and Missile Defence exercise for Ground and Sea Based Air Defence units, flying Air Defence units and various C2 entities (ground, sea and air). This exercise focuses on international cooperation at the tactical level, linking together systems in a live Link-16 network and affords an opportunity to exercise all aspects of Integrated Air and Missile Defence. The nature of SPOW makes it possible to test operational level concepts and procedures at the tactical level.

ALTBMD

This closes the circle of addressing Missile Defence issues at the strategic, operational and tactical levels via the various building blocks just mentioned. To some extent, a connection with industrial partners and knowledge institutes is made in the experiments and exercises mentioned, but it is also present in the ALTBMD programme. This future system for Theatre Missile Defence supports C2 at the tactical, operational and strategic levels. The close cooperation and concerted consultations with key players in the field of Missile Defence, such as Research & Development and other industries, also provide building blocks that are as important as the aforementioned initiatives.

The Way Ahead

It is now leadership's responsibility to merge these various levels. Both Nimble Titan and JPOW include a Senior Leadership Seminar, offering the opportunity to coordinate activities and draw up a common Missile Defence agenda. This in turn should lead to a roadmap with key milestones for Missile Defence capability development, which could be coordinated at both the European and transatlantic levels.

'By having JPOW begin where Nimble Titan ends, and by having representatives from the political domain participate, the strategic lessons drawn from Nimble Titan can be put into practice.'

Continuity can be achieved by delegating the monitoring of progress on the Missile Defence agenda and roadmap to existing international organisations involved in Missile Defence, such as the Extended Air Defence Task Force (EADTF), the Missile Defence Agency (MDA) and the Joint Functional Component

SMART-L Long range surveillance radar aboard a German air defence frigate.

'Europe can only be successful in Missile Defence if Nations look ahead and pro-actively participate, in action and thought, in the steps the U.S. has taken with the introduction of the Phased Adaptive Approach.'

Command for Integrated Missile Defense (JFCC-IMD). The mission of the EADTF is founded on the political will and the military need to enhance cooperation between Air Defence and Theatre Missile Defence units of the participating countries. A precondition, however, is that the present participants agree with the extension of its scope from Theatre Missile Defence to Missile Defence, and that the EADTF is eventually enlarged to represent all countries who wish to contribute to the Missile Defence agenda. The MDA is a research, development, and acquisition agency within the U.S. Department of Defense, working closely with the Combatant Commanders, who rely on the system to protect the U.S., its forward deployed forces, and Allies from hostile ballistic missile attack.[1] The JFCC-IMD is responsible for USSTRATCOM integrated missile defence planning and operational support to include operational and tactical level plan development, force execution and day-to-day management of assigned and attached missile defence forces.[2] Together, these organisations could act as the mortar joining the building blocks of a NATO Missile Defence Initiative.

Conclusion

The need has come to develop a common sense of purpose leading to a Missile Defence initiative. Missile Defence should be considered as a whole here, and therefore, NATO should aim for a comprehensive approach. The past years have seen a number of worthwhile initiatives. It is important, however, that they are streamlined and that they tie in with one another. The challenges we are facing in Europe today can be addressed through building upon these initiatives.

The time has come for NATO Nations to come together and build on the fine initiatives taken in recent years, in order to place more emphasis on Missile Defence issues and make a start on a European Missile Defence Initiative. A common Missile Defence agenda and roadmap must be developed. In order to achieve the maximum effect from these initiatives, political leadership must be committed to forming partnerships with the military apparatus, centres of knowledge and industrial agencies. ●

1. Referenced on the U.S. Department of Defense Missile Defense Agency website at www.mda.mil/about/
2. Referenced on the U.S. Strategic Command website at www.startcom.mil/factsheets/imd/

Lieutenant General Freek Meulman

was born and raised in Eindhoven, the Netherlands. Early in his career, he held several operational assignments in the 5th Netherlands Missile Group in Germany. He completed several studies, including the Netherlands Air War College/Advanced Staff College and the Air University at Maxwell AFB, U.S. He was commander of Netherlands Missile Group 'De Peel' and served numerous operational and staff appointments. After serving as the Deputy Commander CAOC 2, he became Vice Chief/Deputy Commander-in-Chief of the Royal Netherlands Air Force, before assuming his appointment as Deputy Commander (Air) of ISAF X, Afghanistan. On 3 March 2008, he was appointed Deputy Chief of Defence and promoted to Lieutenant General. He is currently the Permanent Military Representative to NATO and the EU Military Committee in Brussels. He is married and has three children.

This article is based on the speech by General Meulman, given during the sixth (3AF) Missile Defence Conference on February 9, 2010 in Lisbon. The original text was edited by Lieutenant Colonel R.P. Hagoort, NLD AF, JAPCC and Major W. Clements, USA AF, JAPCC.

Strategy versus Capability:

The Non-Contribution of NATO Air and Space Power to Counter-Piracy

By Lieutenant Commander Dave Ehredt, USA N, JAPCC

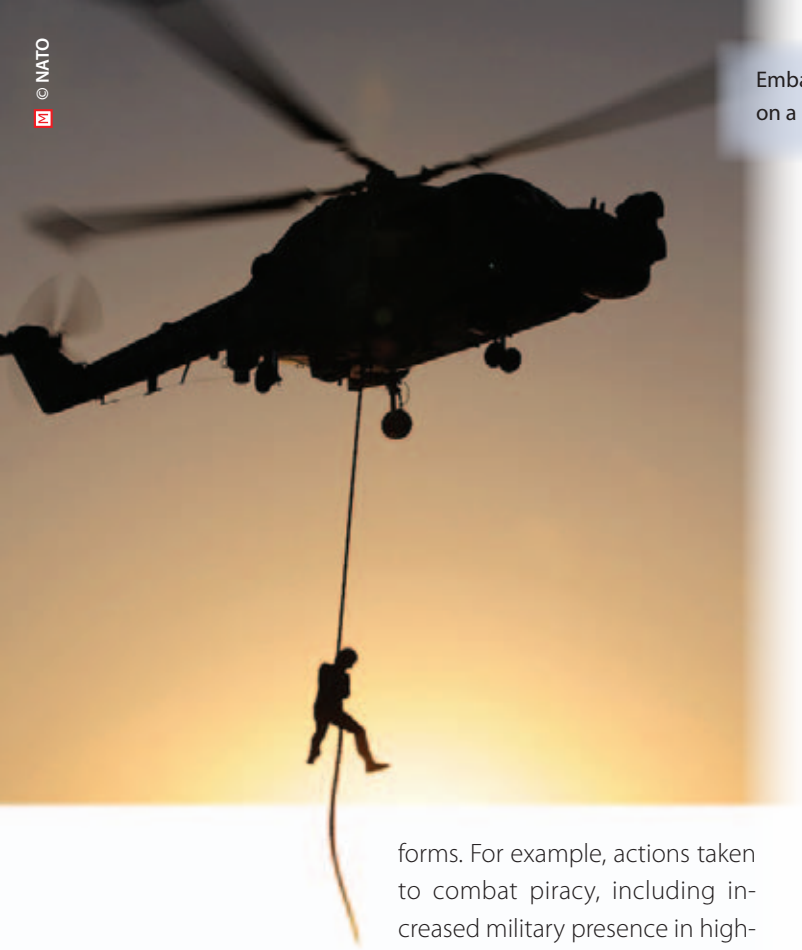
At the time of writing (July 2010), the Alliance has been unsuccessful at convincing Nations to contribute Air and Space (A&S) assets to NATO's Counter-Piracy (CP) mission off the Horn of Africa (HoA). There are some assets flying under the EU Flag, Operation Atalanta, and the U.S.-led Combined Maritime Force (CMF), but other than organic helicopters aboard warships, NATO has contributed no A&S assets to its own mission, Operation Ocean Shield (OOS). Why?

This article seeks to answer that question by first asking its readers to decide for themselves the level of strategic relevance of piracy off the HoA.

The Case for Piracy's Strategic Relevance

According to the International Maritime Bureau (IMB) annual piracy report for 2009, suspected Somali pirates committed 217 incidents of piracy, almost doubling the 2008 figure of 111 incidents. These 217 incidents resulted in 47 hijackings, 867 crewmembers being taken hostage, 10 injuries, four deaths, and one missing person.[1] The geographic region of piracy off the HoA expanded from the Gulf of Aden (GoA) and the waters immediately off the east coast of Somalia in 2008, to include the southern Red Sea, the Arabian Sea, the waters off the coasts of Kenya and Tanzania, and the broader Indian Ocean in 2009. Already in the first half of 2010, 100 incidents of piracy off the HoA have led to 27 hijackings, 544 hostages, and 10 injuries.[2] As of the end of June 2010, 18 vessels were reported as hijacked by Somali pirates and 360 crewmembers were being held hostage.[3] In short, piracy is expanding and becoming more dangerous for seafarers.

It is difficult to estimate the additional financial burdens placed on governments and the maritime industry because of piracy, and the overall impact of piracy on the world economy, particularly as they come in many



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Embarkation Teams conduct practice boardings on a NATO vessel off the HoA.

forms. For example, actions taken to combat piracy, including increased military presence in high-risk areas, rerouting ships to bypass the GoA, paying higher insurance premiums, hiring private security guards, installing self-protection equipment, and paying for ransoms and the costs of delays in delivery of cargoes, are paid by governments or the shipping industry, and many of these are ultimately passed onto the consumer and tax payer.[4]

The U.S. National Security Council wrote in December 2008 that, 'Piratical attacks off the HoA … undermine confidence in global sea lines of communication, weaken or undermine the legitimacy of States, threaten the legitimate revenue and resources essential to the building of Somalia, cause a rise in maritime insurance rates and cargo costs, increase the risk of environmental damage, and endanger the lives of seafarers who may be injured, killed, or taken hostage for ransoms.'[5]

Having considered the case in support of the vital strategic relevance of piracy off the HoA, it is now important to consider the argument against its strategic relevance.

The Case Against Piracy's Strategic Relevance

Piracy is a criminal activity, which, like most crime, cannot be eradicated, only reduced to an acceptable level. Utilizing Best Management Practices (BMP) by ship operators, such as passive defensive measures, deters most pirate attacks.[6] Further, BMP combined with the success of the Internationally Recommended Transit Corridor (IRTC) which began in February 2009, has resulted in a significant decrease in pirate attacks in the GoA between the first six months of 2009 and the same period this year.[7] Further, while the total number of pirate incidents increased from 2008 to 2009, the proportionate number of successful hijackings decreased, which again can be attributed to the use of BMP and the IRTC by ship operators.[8] According to the EU Naval Force Operational Commander, 'All the ships that we have identified as vulnerable and who have sought our support, have got through safely.'[9] This means that the current level of effort by all stakeholders is working. Further, the vast majority of ships being successfully hijacked by pirates are those who are not reporting their position to any of the anti-piracy organizations in the region and who are not following BMP. Should the Alliance be responsible for contributing more military assets for the defence of vessels who are not willing to take the minimum precautions necessary to defend themselves?

Additionally, the claim of piracy's significant impact on the global economy cannot be certain. According to Rand National Defence Research Institute, ' … Piracy does not pose a threat to international maritime trade (which presently generates annual revenues in excess of $7 trillion), much less to the global economy.'[10] Even the highest approximations of the cost of piracy are only $50 billion, and these, according to Rand, are inflated. Considering that less than 1% of shipping transiting the GoA is attacked in any given year, the military presence and its associated cost is out of

proportion. During these tight economic times it is difficult to justify the cost of adding A&S assets to the CP mission.

Although the U.S. Congressional Research Service supported CP operations off the HoA in their study, they also stated that, 'Ship operators (and their governments) might judge that the costs of paying occasional ransoms are less than the costs of taking steps to prevent occasional hijackings such as rerouting or arming merchant ships. The small percentage of ships … successfully attacked and captured [means] the payment of occasional ransoms might be viewed by ship operators (and their governments) as a regrettable but tolerable cost of doing business, even if it encourages more piracy.'[11] Until piracy transforms into terrorism, ecological disaster, or the deepening of the global economic crisis, the most that can be expected is the establishment of the IRTC through which commercial vessels can sail with the expectation of a degree of protection from military warships stationed in the GoA.[12]

Target Point

Even though piracy off the Horn of Africa expands and becomes increasingly more dangerous each year, and in the face of repeated requests by commanders at sea, the Alliance has contributed no Air and Space Assets to Counter-Piracy operations. Why? The Allied Maritime Strategy proposes a more ambitious policy than its capabilities allow and members of the Alliance must come to terms with the gap.

'Piracy is a criminal activity, which, like most crime, cannot be eradicated, only reduced to an acceptable level.'

Assets Required Versus Assets Available

Should the Alliance contribute A&S assets to this operation? The current Alliance Maritime Strategy states, 'To ensure that maritime security remains indivisible across all Alliance members, particularly against the threat of proliferation and trafficking of weapons of mass destruction and missile technology, [and] the dangers of terrorist, piratical activity around the world, the Alliance will ensure that maritime forces are prepared to counter potential security threats from terrorism, weapons of mass destruction proliferation and piracy.'[13] Given that the current Alliance Maritime Strategy declares countering piracy on the same level of strategic importance as countering the proliferation of WMD and terrorism, why has NATO not yet contributed A&S assets to Operation Ocean Shield?

One key factor may be that NATO does not have enough of its primary air asset, the Maritime Patrol and Reconnaissance Aircraft (MPRA),[14] to support such an operation. A study found that for MPRAs to maintain 100% contiguous surveillance patrols, providing identification and RADAR tracking of all vessels in the 1.35 million square miles of sea off the HoA in which pirate activity is being conducted, the task would require 1,732 MPRAs.[15] Adding the number of aircraft from each nation, the Alliance has a total of 257 MPRA assets in its inventory. Covering only half of this area half of the time would still require 433 aircraft,

Infrared images reveal pirate skiffs, identified because of the ladders aboard each vessel.

nearly 70% more than the number of MPRA available. Clearly the results of the study are hypothetical and unattainable, but it is nonetheless a valuable data point when considering the sheer size of the operating area, and the declarations of the Alliance Maritime Strategy in comparison with the number of MPRA available to conduct the mission.

'The number of MPRA has declined drastically over the past two decades, and is projected to decline again by the year 2020.'

Further, the number of MPRA has declined drastically over the past two decades, and is projected to decline again by the year 2020 (see Figure 1). A recent article from Jane's Navy International included this statement about the reduction of MPRA assets: 'The current squeeze on Western defence budgets has been particularly acute for the world's fixed-wing maritime patrol aircraft (MPA) fleets, which are seen by many as not relevant to the land-centric campaigns being conducted in Afghanistan and Iraq, making them an easy target when it comes to spending cuts.'[16] In addition to spending cuts, the lack of a clearly articulated mission, such as Anti-Submarine Warfare which was prevalent during the Cold War, has also likely led to the considerable decrease in assets starting in the 1990s.

Year:	1990	2000	2010	2020
*MPRA:	407	320	257	238

*Data is based on research conducted by the author.

Figure 1: NATO MPRA assets by decade.

The drastic increase in piracy, however, has revealed to the Alliance that the Anti-Surface Warfare mission, which is also performed by MPRA, is still highly essential. In his quarterly assessments the Commander of NATO's CP mission has made several strong appeals for more A&S assets, namely, MPRAs, AWACS, and ISR, stating that additional A&S assets are required to ensure rapid reaction capabilities and to enhance situational awareness.[17] In January this year the EU Naval

Target practice for an aircraft against pirate-like skiffs in waters off the HoA.

Force Operational Commander stated that the deployment of more MPRA to the HoA was his top priority.[18] Despite their critical need, to date these vital air assets have not been contributed by the Alliance, and the number of MPRAs flying in support of the EU and CMF

'When comparing its strategic assertions against available MPRA assets, the Alliance is experiencing a capability shortfall, and that shortfall is playing a part in allowing piracy to escalate in the waters off the HoA.'

CP missions represents less than half of 1% of the total needed to cover the 1.35 million square miles used in the MPRA study referenced above. Thus, the Alliance Maritime Strategy makes declarations that it is incapable of achieving. When comparing its strategic assertions against available MPRA assets, the Alliance is experiencing a capability shortfall, and that shortfall is playing a part in allowing piracy to escalate in the waters off the HoA.

An alternative factor affecting the lack of support to OOS by NATO A&S assets is that those assets are being utilized in other more important missions. It is not a question of whether or not the Alliance has enough assets because there are never enough assets for every mission; instead it is a question of priority. Every nation has a limited number of resources, and consequently is forced to prioritize the ways in which to employ those resources. In the face of the evidence presented earlier in this article against the strategic relevance of piracy, there is ample reason to see why NATO nations are choosing to employ those resources (in this case, A&S assets, and more specifically, MPRA) towards alternative, perhaps more important endeavours, such as Afghanistan, Iraq, and national interests such as patrolling coastal waters. Therefore, an important reason why NATO has not contributed MPRA to CP operations off the HoA is because those scarce assets are already engaged with higher priority tasking.

Draw Your Own Conclusion

It is important for Alliance members to think critically about this issue because each conclusion determines a different road ahead. If you were persuaded by the argument against the strategic relevance of piracy, then you are content with the current level of effort and may seek to scale back the level of ambition of the Alliance Maritime Strategy, recognizing that there are not enough NATO A&S assets (particularly MPRAs) to conduct such an expansive operation as CP off the HoA. Only if piracy becomes linked with something more severe, such as terrorism or ecological disaster, might you need to raise the priority of the CP mission and resolve to deploy A&S assets. If, however, you were convinced of piracy's strategic relevance, then your road ahead may include attempting to convince NATO organizations that nations need more MPRA capacity and those assets need to be deployed to the HoA now. Or, given the sheer size of the operating area which has expanded to more than 2.5 million square miles this year, you might consider that piling on more MPRAs is not a realistic solution by itself, and

Small Boat Teams inspect vessels and collect intelligence from local seafarers.

instead the Alliance should seek a more appropriate and achievable mix of A&S assets, one that integrates the capabilities of non-MPRA aircraft, UAVs and space assets. This, in fact, will be the subject of the second article on the Air and Space Power Contribution to Counter-Piracy, which will appear in the next edition of this journal. ●

1. ICC International Maritime Bureau, 'Piracy and Armed Robbery At Sea Annual Report 2009,' pg 21, 25.
2. ICC International Maritime Bureau, 'Piracy and Armed Robbery At Sea Report – Second Quarter 2010,' pg 20.
3. Ibid, pg 20.
4. U.S. Department of Transportation Maritime Administration, Economic Impact of Piracy in the Gulf of Aden on Global Trade, December 2008.
5. U.S. National Security Council, 'Countering Piracy off the Horn of Africa: Partnership and Action Plan,' December 2008, pg 4.
6. 'Best Management Practices to Deter Piracy in the Gulf of Aden and off the Coast of Somalia,' Version 2, August 2009.
7. ICC International Maritime Bureau, 'Piracy and Armed Robbery At Sea Report – Second Quarter 2010,' pgs 5, 21. Actual or attempted attacks decreased from 100 to 33 during these two time periods in 2009 and 2010.
8. ICC International Maritime Bureau, 'Piracy and Armed Robbery At Sea Annual Report 2009,' pg 25.
9. Jane's Navy International, 'EU Force Seeks 'Eyes in the Sky' as Pirates Head East,' Volume 115, Issue 4, May 2010, pg 31.
10. Rand National Defense Research Institute, 'Countering Piracy in the Modern Era,' March 2009, pg 2.
11. Congressional Research Service, 'Piracy off the Horn of Africa,' April 2009, pg 11.
12. Lennox, Patrick, PhD, Centre for Military and Strategic Studies, University of Calgary, prepared for the Canadian Defense and Foreign Affairs Institute, 'Contemporary Piracy off the Horn of Africa,' December 2008, pg 13.
13. North Atlantic Treaty Organization, 'Alliance Maritime Strategy,' 19 Jan 2010, pg 9–10.
14. For the purposes of this article, Maritime Patrol and Reconnaissance Aircraft (MPRA) is equivalent to Maritime Patrol Aircraft (MPA).
15. The study, 'Ex Ocean Shield: MPA Analysis,' was conducted by the JAPCC with the support of an industry partner in Jul-Aug 2010. The study uses the performance data for the P-3C Orion, and assumes the aircraft provides 100% continuous coverage of the operating area (24/7), and that 4 P-3Cs are required to support 1 aircraft airborne. The operating area for the study includes the GoA, the southern Red Sea, and the Somali Basin up to a distance of 500 NM from the coasts of Somalia, Kenya, and Tanzania. The author is aware of pirate activity farther than 500 NM from the coast but choose that distance for reasons of practicality. For a full copy of the study, email LCDR Ehredt at Ehredt@japcc.de.
16. Jane's Navy International, 'Wings Over Water: Make Do and Mend,' Volume 115, Issue 6, July/Aug 2010, pg 14.
17. Allied Joint Command Lisbon, 'Operation Ocean Shield Campaign Assessment,' December 2009, pgs 3, 6, document is classified NATO Restricted; Commander Allied Joint Forces Command Lisbon, 'Operation Ocean Shield – Periodic Mission Review – JFC Lisbon Input,' May 2010, Annexes A-8, A-14, C-4, document is classified NATO Restricted, releasable to EU and CMF.
18. Jane's Navy International, 'EU Force Seeks 'Eyes in the Sky' as Pirates Head East,' Volume 115, Issue 4, May 2010, pg 26.

Lieutenant Commander Dave Ehredt

entered the U.S. Navy in 1999 through the University of Michigan, and completed flight training as a Naval Flight Officer in 2000. Joining Sea Control Squadron Two One in Atsugi, Japan from 2001 to 2005 as an S-3B Viking NFO, he deployed to Operation Iraqi Freedom aboard USS Kitty Hawk in 2003. While recruiting U.S. Navy Officers in Illinois from 2005 until 2008, he earned his Master's Degree from the University of Chicago. He is currently stationed at the JAPCC in Kalkar, Germany as a Maritime Air Power Expert. His background in the S-3B forms his experience and interest in the contribution of Air and Space Power to Counter-Piracy.

Special thanks to LCDR Roberto Petruzzi, ITA Navy and Maritime Air Power Subject Matter Expert at the JAPCC, who contributed to the creative and editing process for this article.

What Place Space?

The Critical Need to Develop Space Expertise

By Air Commodore Paddy Teakle, GBR AF, JAPCC

A most disturbing trend in recent years has been the propensity of those discussing Air Power to add 'and Space', as if the two are one and the same. They are not, and such a lackadaisical approach neither enhances our credibility nor strengthens our case in the joint debate. Indeed, it is inherently dangerous, for if we fail to differentiate between Air and Space, we expose ourselves to attack and criticism from those who wish to undermine these contributions. Yet, we continue to provide our detractors with the ammunition they need; it is clearly absurd to expect an Air Power specialist to have an equal understanding of Space, but routinely this is exactly what we do. Unless we grow Space expertise, we will fall back to a path of least resistance which will inevitably lead to a failure to exploit the unique aspects of each environment. Some nations, such as the U.S. and France, have taken measures to provide focused oversight of space affairs. The majority, however, have failed to act and continue to misuse air experts to conduct space business.

Most of us struggle for understanding, and when watching 'Star Trek' will more likely comprehend Space as *what* we see on the screen, rather than *how* we see it. This is because Space is intangible and remains the great unknown; only 518 persons have ever been there[1]. It is also an area where technology is totally dominant and the sheer complexity of astronautics and astrophysics precludes detailed comprehension by all but a few. Space is hugely important to us all and

'Paradoxically, although today's military forces are almost totally dependent upon Space Power, they still struggle to grasp its nature and how best to apply it.'

because it is no longer the preserve of a few developed nations, it is increasingly accessible and subject to considerable proliferation of space platforms. Indeed, a growing number of states, some of which straddle the bridge between developed and developing, are now space-faring nations. Ready access to scientific and commercial satellites provides unparalleled global situational awareness to decision makers everywhere, and, thanks to technological advances and the inherent ubiquity of Space, we have

an unprecedented ability to observe our planet. Accordingly, we can conduct activities such as treaty verification, climate change detection and humanitarian crisis response far more effectively than ever before.

Whilst military personnel may claim a modest understanding of Space, the majority of our civilian counterparts cannot. They generally have no concept of how deeply their lives are touched by it, but take away the capabilities provided by and through Space, and much of what they take for granted, disappears. Thus it is clear that we could all benefit from a greater understanding of our dependencies and vulnerabilities.

The Soyuz TMA-17 spacecraft approaches the International Space Station.

Civil Dependency

Perhaps the most obvious and comprehensible example is communications. Whilst land based telecommunications still carry the bulk of traffic, the load is increasingly shifting to commercial satellite communications (SATCOM). Not only is SATCOM a primary bearer in its own right, but it also provides vital back up should land-based networks fail. This utility was well illustrated in the aftermath of 9/11, when mobile SATCOM systems were quickly brought to bear to restore Wall Street services, thus denying Al Qaeda their objective of financial paralysis. In emergencies, satellite systems support a diverse range of applications from rapid deployment to accurate geo-location of 911 type calls, enabling greater and deeper coordination and synchronization between the separate emergency services. SATCOM reaches so far into the fabric of modern society that it is difficult to predict the effect on social stability should satellite broadcasting be lost or interrupted for a prolonged period.

If the role of Space in telecommunications is well understood, its role in underpinning global business is not. The figures speak volumes; in 1983, the daily transfer of capital amongst international markets was about $20 Billion; today it is $1.6 Trillion[2]; all but a fraction is space-enabled. Even in developing nations, satellite navigation receivers support the precision timing needed by terrestrial communications systems to conduct everyday financial transactions. Moreover, efficient, low cost, highly accurate timing from satellites is fundamental to ensuring the security, integrity, authenticity and confidentiality of electronic data exchange.

The global competition for energy is fierce and the industry is heavily reliant on Space. Not only are timing references to 1/1000th of a second needed to effectively and efficiently manage power distribution networks, but satellite-derived weather data allows managers to implement contingency plans whenever severe weather is predicted. The potential rewards from Space are enormous; improve forecast temperature accuracy by 1° Fahrenheit and the U.S. electricity sector alone could save almost $1 Billion every year[3]. In food, health and water security, Space facilitates more efficient and effective movement of resources and continuous earth observation allows specialists to, amongst other things, rapidly respond to flooding or drought, monitor agricultural output and observe, forecast and contain the spread of disease. Space has transformed the fields of transportation and logistics, with Position, Navigation and Timing

(PNT) usage growing almost exponentially. Accurate asset tracking and traffic management on land, sea and air has allowed the commercial sector to achieve unprecedented levels of efficiency, helping to minimize cost growth and reducing negative environmental impact.

But what of the space contribution to social well-being? The explosion of information and communications technology has made our lives easier and more productive and whilst today's Space based services are indispensible, exciting new applications and the changing economics of Space are driving market expansion and bringing the prospect of an even brighter future.

Target Point

Mankind's dependence on Space is growing, yet our knowledge of the domain is weak. New, closer relationships between the military and commercial sectors must be established to protect and assure the environment. The importance of Space is such that military strategists, planners and operators must not fall into the trap of simply coupling it to the Air domain.

Military Dependency

Military dependence on Space is almost absolute and, while hyperbole surrounds other capabilities and the Revolution in Military Affairs, improved space capability has definitely changed, forever, the way we operate. Paradoxically, although today's military forces are almost totally dependent upon Space Power, they still struggle to grasp its nature and how best to apply it. There is, however, general acceptance that space technology will help provide the necessary resilience in the face of the major threats to global security, whatever they may be and from wherever they may come. Defence experts point to Space as the dominant technology development area with about 90% of current major equipment programmes assessed as being reliant on space-based capability.

Arguably, the most profound effect of Space on military operations has been the development of PNT which, many assert, has helped redefine mass as a principle of war. These experts may be correct; 4 GPS-guided bombs delivered from a single platform today can achieve what 600 aircraft and 3,000 bombs could not seventy years ago. Profound movement is also evident in the area of SATCOM, where the nature of the relationship between the military and the commercial sectors is changing to reflect a new world order. Notwithstanding their special relationship with defence contractors, the military has always been wary of getting too close to the commercial sector. However, there is a now such a deep interdependence between the two that this option is not available and a change in culture is required. The military craves ownership, it likes to define operating areas, establish boundaries and impose control, but in Space this is not possible. Consequently the imperative is to closely partner and share with those who were previously kept at arm's length. Without such relationships, operations will be severely constrained. For example, could the International Security Assistance Force in Afghanistan possibly maintain its operational tempo if military systems were forced to carry the 85% of traffic currently routed through commercial or private sector SATCOM?

We live in the information age, yet information, in and of itself, is meaningless; conversely, knowledge is meaningful, and the distinction is context. ISR provides context and allows commanders to make timelier, higher quality decisions. The commander must build an ISR constellation which includes air, space and surface assets and which melds GEOINT, SIGINT, MASINT, IMINT and HUMINT into a deep and complimentary system of systems.

Joint Personnel Recovery (JPR) will be one of the Commander's top operational priorities as it underpins the morale and ethos of his force. Due to a complete reliance on space-derived product, it is almost inconceivable that he would accept the operational risk of continuing a mission without assured space support. Similarly, when faced with a credible Theatre or Ballistic Missile threat, reliance on early warning from space-based assets is such that a Commander will likely demand absolute space assurance. Additionally, the majority of command, control and communication links for unmanned and many manned air

assets reside in Space and a Commander will seek assured space access to avoid the risk of operational paralysis caused by its potential loss.

'Space is hugely important to us all and because it is no longer the preserve of a few developed nations, it is increasingly accessible and subject to considerable proliferation of space platforms.'

Vulnerability

But is absolute space assurance possible? A quick look at vulnerability would suggest not. For many years it was assumed that space systems were in a safe sanctuary; today we know that they are not. Indeed, there are multiple threats; some emanate from the space environment itself, such as solar storms, coronal mass ejections and meteorite storms, whilst others are genuinely malign, such as SATCOM piracy and interference. In contemporary operations much is made of the financial asymmetry of the Improvised Explosive Device (IED), but this pales in comparison to the asymmetry between a multi-million dollar satellite and an RF jammer which can be assembled from commercial off-the-shelf components for as little as a few hundred dollars. Whilst satellites may have an inherent susceptibility to jamming, many point to the space ground segment as the 'Achilles Heel' of the entire space system, for it is here that exposure to physical and cyber attack is greatest. Then there is the threat from space debris, with over 12,000 known objects[4] currently in orbit. On 10 Feb 09, the disastrous consequences of operating in an increasingly 'dirty' environment were seen when a serviceable Iridium satellite collided with a defunct Russian Kosmos satellite. Both were destroyed, causing major, short-term disruption to the Iridium SATCOM constellation and placing over 500 additional pieces of debris into orbit. This striking example of the consequences of poor space situational awareness graphically illustrates the requirement for a reliable, shared space picture to facilitate the safe interaction of all Space users. This is not a desirable path, it is an essential one.

Summary

This article has shown the importance of Space as a high ground from which to observe earth. It has identified a new symbiotic and immutable interdependency between the military and civil sectors. It suggests this should be welcomed and not feared, opining that there is no alternative other than to share the responsibility for assured access to, and the safety of, Space. It highlights an ignorance of Space and the need to become 'Space smart' by growing Space expertise. It warns that Space must not remain the great unknown and that investment in space education and training is urgently needed. It recommends increased vigilance, through enhanced space situational awareness in order to counter both today's and tomorrow's threats. Above all, it demands that Space Power be given due respect and warns that if we continue to treat it as an adjunct of Air Power, we will fail to appreciate its special place in today's world. ●

1. WikiAnswers – As of June 15, 2010, a total of 518 humans from 38 countries have gone into space according to the FAI guideline.
2. United States Joint Forces Command – The Joint Operating Environment 2010 (18 Feb 2010) page 8.
3. Space Secures Prosperity – Ukspace (16 Sep 2008) page 15.
4. 4 inches or greater.

Air Commodore Paddy Teakle (DSO, OBE)

is a navigator who has flown over 3000 hours in Vulcans, Victors and Tornados. He has Operational experiences in CORPORATE, GRANBY, ALLIED FORCE, TELIC, NATO's Earthquake Relief Mission to Pakistan and ISAF. Air Cdre Teakle's ground tours include head of Operational RAF Offensive Air Doctrine; Chief of Strategy, 5ATAF CAOC; Director UK Joint Force Air Component and A3 Division Head at ACC Ramstein. His most recent post was Director of Air Ops, Air Coordination Element, HQ ISAF. Air Cdre Teakle is the Assistant Director Transformation, Joint Air Power Competence Centre.

A Royal Netherlands Air Force C-130 preparing for a heavy load.

NATO's Achilles Heel

The Case for NATO Logistics Command Authority

By Major Ron Peterson, USA AF, Defense Logistics Agency Energy – Korea

'My logisticians are a humourless lot … they know if my campaign fails they are the first I will slay.'
Alexander the Great

History is littered with examples, both ancient and modern, of how logistics arguably played the crucial role in war. We hardly need to be reminded that for every Alexander the Great (who was first credited with incorporating logistics into his strategic plans), there is a Napoleonic invasion of Russia (his armies outstripped their supply trains and never accounted for the lack of foraging available). For every Joseph-Simon Gallieni (the French General who used the French taxi service to ferry 4,000 servicemen to the front because of a choked rail system), there is a General Schwarzkopf whose forces created 'iron mountains' in their aerial ports because individual units were not able to track the assets they ordered – so they ordered them again … and again.

Long before an offensive can start, professional logisticians must gather and transport men and materiel, and provide for the sustained flow of supplies and equipment that throughout history has made the conduct of war possible. Even before the Wright brothers flew at Kitty Hawk, the U.S. Secretary of War Elihu Root warned, 'Our trouble will never be in raising soldiers. Our trouble will always be the limit of

possibility in transporting, clothing, arming, feeding, and caring for our soldiers ….'. Historically, success on the battlefield is dictated by how well forces manage their available logistics, and combat victories are linked more directly to mobilising and applying economic and industrial powers than any type of strategic or tactical plans and manoeuvres. NATO has had difficulty in these areas. For this reason, NATO operations will always struggle for operational success and, if faced with a persistent and capable enemy, could ultimately fail – especially if NATO continues to be a collection of individual Nations unwilling to create the logistics environment required for ultimate success.

Historical Logistics Transformation

It should come as no surprise that Expeditionary Operations have become the reality for NATO. During the 2009 ACT Expeditionary Operations Conference, General Mattis, the current Commander of U.S. Joint Forces Command and, at that time, Supreme Allied Commander Transformation, told the audience that 'Expeditionary Operations were the key to Transformation within NATO … and that Logistics was the key to Expeditionary Operations.'

Although the Bosnian and Kosovo Operations were within Europe, they gave the Alliance its first real taste of Expeditionary Operations. When Article V was invoked after the terrorist attacks of 9/11, NATO's concept on Expeditionary Operations was stretched to a new level. NATO's International Security Assistance Force Operations in Afghanistan have tested the Alliance's military limits in both capacity and willingness. Since NATO took command of ISAF in 2003, the Alliance has gradually expanded the reach of its mission, which was originally limited to Kabul, to cover Afghanistan's whole territory. The number of ISAF troops has grown accordingly from the initial 5,000 to almost 120,000 troops drawn from 47 countries, including all 28 NATO members.[1]

NATO Logistics has gone through its own transformation over the last 20 years. During the Cold War, NATO Logistics Support was primarily a National responsibility. NATO's only real involvement was in establishing overall logistics requirements and guidance. By the early 1990s, NATO Logisticians recognised that the Nations' Armed Forces were more frequently losing the National funding battle. This necessitated a fundamental change in the way NATO would have to provide logistics. Co-operation and multi-nationality within the logistics community would have to be enhanced.

'Expeditionary Operations were the key to Transformation within NATO … and Logistics was the key to Expeditionary Operations.' – General Mattis

NATO's 1999 Strategic Concept addressed conventional forces, by recognising that with 'reduced overall force levels and constrained resources, the ability to work closely together will remain vital for achieving the Alliance's missions' – and – 'Cooperation in the development of new operational concepts will be essential for responding to evolving security challenges.' It was this guidance that launched the subsequent initiatives involving NATO's force structures: the Combined Joint Task Force and the NATO Response Force. While these initiatives were an improvement and were able to realise some of the cooperative logistics envisioned, each Nation is still responsible for ensuring, either individually or through cooperative arrangements, the provision of the logistic resources required to support its own forces.

Target Point

With its forces stretched from Afghanistan to Kosovo, the Mediterranean, Iraq, Somalia, and off the Horn of Africa, NATO is deployed like no other time in its history. NATO's role is expanding and it can ill afford the current inefficiencies in its logistics system. While there have been advances in this arena, the NATO Commander needs a system that allows him to exercise true logistics command.

While each Nation still bears ultimate responsibility for the logistical support of allocated forces, NATO has come to realise that neither NATO nor its individual Nations are capable of bearing complete responsibility for logistics support during NATO operations. Thus, the NATO Policy for Co-operation in Logistics and the NATO principles and policies for logistics, set out in MC 319/1, establish the principle of collective responsibility. After a few iterations, the principle of logistics collective responsibility has been established as 'The set of NATO's and Nations' individual and largely complementary obligation to cooperatively organise and deliver the overall logistics support of NATO operations, taking into account one another's requirements and constraints.'[2]

'A Logistics Chain management capability for NATO Operations would improve the logistics effectiveness of NATO Forces.'

Who Has Control?

While NATO logistics is in a nebulous region between individual Nation responsibility and collective responsibility, there is no doubt that NATO commanders must be given sufficient authority and control over logistics resources to ensure their forces are properly supported.[3] In 2005, while he was still SACUER, General Jones addressed the problem of the Operational Commander not having complete control over his logistics. He described logistics as an arena, like many others within NATO, which was still firmly entrenched in the Cold War defensive stance. He explained that within current NATO operations, 30 percent of the logistical operations were comprised of National support activities. Obviously these support activities are there to support the NATO operation, but his point was that this 30 percent is essentially unavailable to the commander because it is not subject to the commander's authority.

Command authority is not the only issue. The Commander also does not have the required logistics flexibility or visibility to meet operational requirements. These problems have been addressed through two different avenues. The first is the Joint Logistics Support Group (JLSG), an expeditionary logistics headquarters, fully scalable and task oriented to match the mission with the functional staff within the NRF structure. While the NATO Commander has the responsibility to ensure his forces are appropriately supported, he has neither the time nor the means to properly conduct this Command Authority. The JLSG serves in this capacity. The purpose of the JLSG is to plan, synchronise and execute theatre-level logistics to support NRF units. The JLSG consists of subordinate organisations across the spectrum of logistics functions and the success of the JLSG hinges on its ability to achieve the integrated logistics of command, interoperability and multinational logistics solutions. The second problem for the NATO Commander is visibility. Because each Nation brings its own logistics support units, the Commander has no real visibility over logistics troops, capabilities, assets, or the supply pipeline.

The Commander must be given or have access to the proper information to make informed logistical decisions.

Logistics Chain Management

In the civil industry, logistics have been managed by a networked solution to view the 'end-to-end' process of receiving, transporting, storing, distributing and re-distributing equipment, material and personnel to an end user. This process has seen success in many National logistics chains; however, because of the inherent nature of NATO operations, this author argues that it is an absolute necessity for NATO logistics. This capability would allow all Nations and other actors to: display committed capabilities; permit the NATO Commander to set priorities and assess deficiencies that might limit National force contribution capabilities; let NATO, Nations and other actors identify potential options to overcome deficiencies; and present a collective view so Nations can identify opportunities to offer mutual support in order to meet the Commander's intent.

A Logistics Chain management capability for NATO Operations would improve the logistics effectiveness of NATO Forces. This is especially true considering the rapidly changing and complex expeditionary environments in which supporting Nations, NATO Agencies and civil actors are currently involved. The need for a NATO Logistics Chain management manifests itself through: significant equipment, financial and manpower inefficiencies; independent, usually un-coordinated and often unnecessarily redundant national support systems; incomplete visibility of available logistic resources that result in wasted opportunities and the needless provision of additional supplies; and insufficient logistics decision support.

This need has finally been addressed with the development of NATO's Operations Logistics Chain Management (OLCM). The ultimate purpose of this capability is to 'optimise the operational planning and execution of the flow of logistic resources and services into, within and out of the NATO Joint Operational Area. The flow will be synchronised to meet the NATO

Convoy from Kandahar airfield (Kandahar) to Tarin Kowt (Uruzgan).

RNLAF Chinook used for transport of vehicles.

Commander's requirements and will also assist nations to achieve the level of support necessary to meet the NATO Commander's operational intent.'[4]

NATO's OLCM carries the potential to reduce National process redundancy, streamline NATO's logistics footprint and provide the NATO Commander with the required logistics visibility, authority and flexibility to meet his operational requirements.

Conclusion

NATO leadership has continued to stress the importance of operating in new environments, which means Expeditionary Operations for all of the Alliance Members. The military arm of NATO continues to adapt and evolve to the political will. NATO cannot forget, however, that the logistics infrastructure and processes must evolve at the same rate to support the new spectrum of demands. The keys to supporting both combat and peacetime operations successfully are robust, responsive, and flexible logistics systems. If fully embraced by member Nations, the tools mentioned in this article would empower the NATO Commander.

The combination of the JLSG, to support logistics authority, and the logistics network tools of OLCM, will enable the prioritisation and coordination of the entire flow of logistic resources and provision of services into, within and out of the NATO Joint Operational Area based on the NATO Commander's intent. Success, however, is not guaranteed. While JLSG and OLCM give the NATO Commander the tools to operate an effective and efficient logistics operation, individual Nations must develop an intimate trust within the organisation. Nations must trust that they can allow total visibility of their assets within the system, that any Nation will fully support another's requirements when required, and that the Commander will do what is right and proper to ensure NATO success. ●

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Major Ron Peterson

is a Logistics Officer whose professional experience includes air mobility, fuels management, and supply, in locations as diverse as Alaska and South Korea. He has served as a flight commander, squadron operations officers and instructor. He was selected as a member of the military training team for the Multi-National Security Transition Command in Iraq, where he led the logistics effort to establish a new airbase for Iraq's C-130 aircraft. He was a member of the Combat Service Support Branch of the Joint Air Power Competence Centre (JAPCC) in Kalkar, Germany for three years. He has recently been assigned as the Operations Officer for Defense Logistics Agency Energy – Korea which provides bulk petroleum supply, distribution and quality management for U.S. Forces in the Republic of Korea.

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A New York City fireman calls for 10 more rescue workers to make their way into the rubble of the World Trade Center.

Contemporary Operations with an Eye on the Future

By Colonel Jay R. Bickley, USA AF, JAPCC

'Black Swan [occurrences] are highly improbable events with three principal characteristics: they are unpredictable; they carry a massive impact; and after the fact we concoct an explanation that makes them appear less random and more predictable, than they were.'
Nassim Nicholas Taleb

Introduction

Truly 'game-changing' events in history are rare, but significant. They not only alter our course, they change our world view. For NATO, there have recently been two very significant 'Black Swans:' the demise of the Union of Soviet Socialist Republics (USSR) and the terror attacks of September 11, 2001.

For an Alliance that was developed for the sole purpose of keeping Russia and its satellite countries at bay, the collapse of the USSR clearly changed the game for NATO. For more than a decade, NATO struggled to find its way in a changing world. Discussions of peace dividends ruled the day. The focus of the United States shifted away from European security to a conflict over resources in the Middle East and an ever-growing and developing Chinese influence in the world. In fact, there were many that questioned the Alliance's continued relevance. NATO obviously survived this 'highly improbable' event and found its services still needed in a variety of peace-keeping and humanitarian missions. During this period, NATO also played a leading role in stabilising the Balkans. It appeared that these types of operations would be the future … that is, until September 11, 2001.

On the morning of September 11, NATO and the world woke up to news of another 'game-changing' event. The terror attacks of that day led the Alliance to where it is today … struggling to adapt its forces and its structure to fight a counterinsurgency in Afghanistan. As NATO transforms into a military force suited to fight

the current conflict, one can't help but wonder what the next 'Black Swan' will be, and how NATO can best prepare for it.

Target Point

Faced with an uncertain future, NATO must be prepared to face the unknown. NATO has recently adapted to two events, the demise of the USSR and the terror attacks of September 11, 2001, but what is next? NATO must be structured and prepared to face not one, but multiple futures. Specifically for Air Power, future systems must be interoperable, flexible (adaptable), and affordable in order to be viable options.

An Eye on the Future

In order to be an effective entity in the future, NATO must continue on its path of transformation to meet today's threats, while simultaneously preparing for the future. It must continue the work it has done, such as ACT's Multiple Futures Project[1], on analysing alternate futures to meet possible asymmetric threats, as well as deal with a near-peer competitor. This transformation, however, is easier said than done because we can't predict the future. We can, however, develop and posture our forces to meet as many possible landscapes as the future may present.

NATO 'Black Swans'

The following scenarios are presented to describe the types of events that NATO could be forced to deal with in the future.

Lost in Space: An adversary develops Electro Magnetic Pulse (EMP) Space weapons capable of destroying or disabling Space assets operated by Alliance member states. A weapon of this kind could negate the Alliance's Space dominance and put at risk such capabilities as Satellite Communications, Global Positioning Satellite navigation and precision weapons, as well as surveillance and early warning systems.

The era of NATO's free access to Space would be over, forcing the Alliance to find ways to operate with a decreased reliance on Space, while also developing ways to defend against Space attack.

The first step in mitigating this type of threat would be for NATO to develop a policy which recognises its dependency on Space and the need to defend access to it. Space is a critical domain and must be dealt with proactively by the Alliance.

Loose Nukes: A terrorist group detonates several low-yield nuclear weapons simultaneously in Los Angeles, Washington DC, Paris, London, and Frankfurt. Affected Nations, whether by blast or fallout, would be forced to turn their attention and resources inward to provide basic needs and security to their populace. An event such as this could result in these countries, specifically the United States due to its geographic location, sealing their borders and taking an isolationist posture in the name of security.

This type of event would obviously have a profound impact on the NATO Alliance, which would presumably attempt to stand behind its Article V commitments.

NATO must be prepared to not only aggressively work to avoid such an event, but prepare for the aftermath. Military and civil authorities must work together to develop procedures and capabilities that are dual role in nature, to assist affected populations, mitigate chaos, and restore order.

Back to the Future: Russia's concern over NATO expansion continues to grow due to the entrance of new member countries – the Ukraine and Georgia. They tighten their relationship with China based on China's insatiable appetite for resources and their own need for capital. Their alliance grows and strengthens to the point that Russia decides it can reassert itself as a world power by expanding its western borders into NATO.

The NATO reaction (or inaction) to Russia's 'war' with Georgia in the summer of 2008 can be perceived as evidence that any offensive action taken by Russia will leave the Alliance pondering a response. An

aggressive move by Russia into Eastern Europe would certainly change the game for NATO.

There are those who believe that conventional state-on-state conflict no longer exists … that belief is only true until it isn't. While recent conflicts have been limited in nature, the Alliance must continue to prepare and plan for state-on-state conflict to remain relevant. It must maintain its ability to uphold Article V against all enemies, whether those enemies attack conventionally or asymmetrically.

Cyber Wars: Simultaneous cyber attacks on North America and Europe take down power grids, financial institutions, air traffic control, communications (both military and civilian), and utilities.

An asymmetric attack of this magnitude would expose NATO's reliance on networks and counter the Alliance's technological strengths. It would leave NATO dealing with issues of reprisal, culpability, and national sovereignty. This would significantly expand the battle space of the future.

As with space, the cyber domain is critical to the Alliance. NATO must formally recognise the need to defend against threats of this nature, as well as prepare to deal with its aftermath.

Soldiers help carry a litter with a 150-pound mannequin through an obstacle course. The red smoke acted as a chemical agent explosion, and the Airmen had to quickly don their gas masks and get the 'downed pilot' to safety.

Air Power Solution

The key to dealing with the unknown is an Alliance structured and prepared to face not one, but multiple futures.

For Air Power (specifically, but not exclusively), this means that capabilities and systems of the future will need to be interoperable, flexible (adaptable), and affordable in order to be viable options for Alliance nations faced with shrinking defence budgets and an uncertain future.

Interoperability is one of the cornerstones of Joint/Coalition war fighting and the element that is most troublesome. Because nations, and services within many nations, manage the procurement of their own weapon systems, interoperability with external assets is often an afterthought. In NATO, interoperability of systems needs to be brought to the forefront. As we inch closer to making network centric warfare a reality, and as the parameters of the battle space become more uncertain, it is now, more than ever, imperative that systems are able to communicate and pass information to the war fighter, regardless of what national flag he or she is wearing. Standardising interoperability of systems within the alliance would not only enable synergistic operations between allied partners, but also cut down on redundancy, cost, and end up increasing flexibility.

Flexibility truly is the key to Air Power – due mostly to the lack of physical constraints within the Air and Space domains. To fully leverage this advantage for an uncertain future, however, air systems need to be designed with flexibility in mind. The uncertainty of tomorrow's conflicts calls for systems to be not only multi-role, but multi-capable. For example, systems will need to be designed with modular payload capabilities that would enable the same platform to be used, and used effectively, for different mission sets. With the development of aerial systems that are capable of operating either unmanned or manned, on military or civil missions, and with 'plug and play' type payloads, NATO nations would be able to leverage the capabilities of their allied partners to fully optimise these effects and drive down costs that are inherent in redundancy.

Air Power and affordability have never gone hand-in-hand. This is mainly because Air Power capabilities are generally at the cutting edge of emerging technology. The questions then become: how can NATO maintain viable systems; remain ahead of its adversaries; and do it within the budget constraints of contributing nations? One answer is through consolidation of effort and capability. This concept is a difficult one from a political stand point, but operationally, it makes perfect sense. Transitioning to a role-specific structure would allow smaller nations to contribute niche capabilities, enhancing the overall strength, adaptability, and flexibility of the Alliance. Concerns over loss of redundancy and the possibility of a nation opting out of an operation, hence leaving the Alliance without a specific capability, are valid, but in this time of fiscal decline, some level of risk will have to be acknowledged.

'In order to be an effective entity in the future, NATO must continue on its path of transformation to meet today's threats, while simultaneously preparing for the future.'

One example of systems that would fit nicely into this suggested framework is light attack aircraft. A small turboprop-driven fighter and attack aircraft would not only increase flexibility, but in many cases, such as armed over-watch missions, and Close Air Support in an urban environment, be better suited than more capable fourth- and fifth-generation fighters. A light attack aircraft would offer nations a relatively inexpensive opportunity to fill the type of niche capability previously discussed. This is not to say that aircraft such as the Joint Strike Fighter won't play a role in future conflict, because they most certainly will, but a light attack option could fill a gap in current capabilities at a fraction of the cost.

Is NATO on Track?

NATO appears to be aware of the need to plan for an unknown future. As part of its Long-term Capability Requirements (LTCR) study, the Alliance produced an alternate futures paper. The objective was to examine the types of military capabilities that may be required across a broad range of mission types that Alliance forces may be called upon to undertake in the future.

Additionally, at NATO's 60th birthday celebration in April of 2009, it was announced that the Alliance would complete a review of its Strategic Concept. This is the first review in over a decade and is long overdue; however, it shows the Alliance is aware of the need to adapt.

Consensus on a new concept may be difficult, but it must be done in order for NATO to remain relevant in a dynamic and uncertain world.

Conclusion

If the Alliance becomes too focused on fighting 'the' war, it will run the risk of not being prepared for an 'A', 'B', or 'C' war. The challenge is that NATO must do all these to remain relevant. It must field forces and weapons systems that are interoperable, flexible, and affordable enough to meet the unknown threats of the future.

NATO may not be able to predict with a high level of certainty the next 'Black Swan,' but through vigilant strategic planning, it can be as prepared as possible for the next 'game-changing' event. ●

1. Based on NATO's Allied Command Transformation (ACT) Multiple Futures Project.

Colonel Jay Bickley

completed pilot training at Sheppard Air Force Base, Texas in December 1991. He has served as a Flight Commander, Director of Operations and Squadron Commander. He has flown the T-37, T-38, TC-18, and E-3 aircraft. He is a command pilot with more than 4300 hours of flight time including 160 hours in combat. Col Bickley is a graduate of the United States Air Force Air Command and Staff College as well as the National War College, Ft McNair, Washington D.C. He holds three masters degrees in aviation and national strategic studies related topics. He is currently the Branch Head for Combat Air at the Joint Air Power Competence Centre for NATO.

B-17 Flying Fortresses from the 398th Bombardment Group fly a bombing run to Neumunster, Germany, on April 8, 1945. On May 8, Germany surrendered, and Victory in Europe Day was declared.

Military History – Handle with Care

By Wing Commander Anthony Stansby, GBR AF, JAPCC

'Deep is the gulf between works of history as written and the truth of history, and perhaps never more so than in books dealing with military history[1].'
B. H. Liddell Hart

Introduction

The Concise Oxford Dictionary defines history as 'a continuous, usually chronological, record of important or public events' and 'the study of past events, especially human affairs'. This article seeks to assess the value of history to the military profession and, in particular, to highlight some of the pitfalls that await the unwary.

Before we start, it may be useful to consider what the student of history is seeking to achieve. From this author's perspective, the aims appear to fall into two broad categories: knowledge of past events; or an explanation of why events happened. While both may be summarised as a search for the truth, there are some fundamental differences. The former is the traditional domain of civilian historians, yet their work also has military utility by providing some context to help us understand the present security environment. It may also offer some clues to the future. But the military student typically goes further, seeking a more practical application by attempting to determine cause and effect. This is undoubtedly more problematic, but the rewards of success appear immense. So, returning to the opening definition, let us consult the 'record of events' and commence our studies.

Analysing the 'Record of Events'

Here we immediately encounter perhaps the greatest paradox of historical enquiry – the sheer volume of material available, allied to the realisation that, no matter the extent, the body of evidence will never be complete. Accidental omission is the historian's 'known unknown'. Consequently, our understanding of the past is

destined to constantly evolve as new material comes to light or old material is examined from different perspectives. Deliberate omission, on the other hand, can be equally dangerous. For examples, we need look no further than the many 'official histories' of military units, be they army regiments or air force squadrons. Such work is described by the eminent historian Professor Sir Michael Howard as 'myth-making' or *'the creation of an image of the past through careful selection and interpretation, in order to create or sustain certain emotions or beliefs.'*[2] While the intent of the regimental historian may be entirely honourable, the same cannot always be said when the 'myth' is used to deliberately deceive and inflame, most commonly in the name of patriotism.

© U.S. Air Force

A B-52 Stratofortress dropping bombs in the 1960's.

Errors in the 'record' are equally common and it should be no surprise that the fog of war descends as thickly on the record as on the reality. Perhaps more unexpected is the danger of encountering deliberately falsified material. Liddell Hart recounts such examples from the First World War, *'a general could safeguard the lives of his men as well as his own reputation by writing orders, based on a situation that did not exist, for an attack that nobody carried out – while everybody shared in the credit, since the record went on file.'*[3] Similarly, Stalin's Soviet Union provides ample evidence of attempts to rewrite history, for example through the altering of politically sensitive photographs to remove individuals who had subsequently been purged.[4]

Two further dangers result from the act of historical enquiry itself – distortion and simplification. The process of setting out the facts requires the historian to impose a narrative on events, inevitably providing the reader with a specific lens with which to view things and which may prove difficult to discard. Furthermore, if the account is to be accessible, the chaos of history must be simplified and presented in a manner that meets our craving for logical explanation. The historian's perfect hindsight can all too easily generate a certainty between intent and outcome that was anything but certain at the time.

Finally, as with any matter requiring research and the weighing of evidence, we must beware the danger that stems from confirmation bias.[5] While the following quote from Maj Gen Jonathan Bailey relates specifically to the Russo-Japanese War of 1904–5, our own experience undoubtedly offers numerous contemporary examples: *'One lesson of 1904–5 was the frequency with which different observers could view an event and come to totally different conclusions. Partisans of particular doctrinal approaches tended to find what they wanted to suit their own arguments.'*[6]

In light of these dangers, it is little surprise that Michael Howard advises that any study of military history must encompass width, depth and context[7] in order to reach at least a 'partial truth'. For the busy military professional, this is easier said than done, save for those few who are able to undertake a period of sponsored academic study or have the interest and commitment to conduct detailed research in their spare time. For the rest of us, the risk is clear and we would do well to heed Lt Gen John Kiszely's warning that *'A little military history may be more dangerous than none at all'*[8], a message that has clearly not reached all those who set reading lists and essay titles at military staff academies.

Explaining 'Why Events Happened'

While concentrating on the historical 'record', there is little immediate or obvious difference in the approach adopted by the Land, Maritime or Air environments. However, when we go further and seek to use history to explain the relationship between action and events, differences start to appear. It is here that the airman's

belief in the inherent strategic possibilities unique to his environment comes to the forefront and may dominate any analysis. What is less defensible is the tendency to place the art of war firmly subordinate to its scientific undertaking. But perhaps this is an inevitable result of the primacy of technology in the air environment and, consequently, the nature of the individuals drawn to this particular branch of the military profession. Whatever the underlying cause, those who study the history of Air Power often represent extreme examples of a *'… cultural predisposition* [which] *encourages a search for certainty with respect not only to fact, which would be challenging enough, but also to causality, which is infinitely more problematic.'*[9] Consequently, whole libraries can now be filled with accounts of past air campaigns which seek to explain the outcome in terms of targets hit and weight of effort applied in an attempt to deduce a formula for success that can be applied to the next conflict. This is a potentially grave error when *'The roots of victory and defeat often have to be sought far from the battlefield, in political, social and economic factors'*[10], not to mention the often underemphasised role of chance in all military affairs.

This belief in an explicit and consistent relationship between cause and effect is the Holy Grail that underpins our 'effects based' approach and drives the lessons identified/lessons learned industry. Yet even at the tactical level, we can rarely be absolutely certain as to physical effect, especially against an enemy skilled in the art of deception. To go further and attempt to draw links between tactical actions and strategic cognitive effects risks ignoring Professor MacGregor Knox's warning that: *'Similar causes do not always produce similar effects, and causes interact in ways unforeseeable even by the historical (sic) sophisticated.'*[11] As Clausewitz appreciated, war is a battle of wills. In other words, its prime effect is coercive, the only alternative being a strategy of annihilation, likely to result in charges of genocide. By introducing the human decision making process into the equation, however, the search for historical truth becomes vastly more difficult.

To advance our understanding in this field clearly requires the evidence of senior decision-makers on all sides, but this introduces a number of additional challenges. Key individuals or documents may not have survived a conflict, while those that have, may not be accessible. Similarly, there is no guarantee that defeated (or even victorious) leaders will be willing to cooperate. Liddell Hart reminds us, *'Men in high office are apt to have a keen sense of their own reputation in history. Many documents are written to deceive or conceal. Moreover, the struggles that go on behind the scenes, and largely determine the issue, are rarely recorded …'*[12]

Target Point

Despite every advance in technology, warfare remains a human endeavour deeply influenced by culture. Knowledge of history is a key part of cultural understanding but the past is as open to interpretation as the present. How much faith should we place in the 'truth' of history and why are attempts to draw historical lessons so often found wanting? Perhaps history is not always what it seems ….

Looking to Military Examples

While remaining wary of the danger of bias, it may, nevertheless, be instructive to consider a number of examples of this search for the key to strategic success. Perhaps the fiercest debate, even 60+ years after the event, is reserved for the Allied strategic bombing campaign of World War II. Col Phillip Meilinger recounts[13] the antagonism that surrounded the selection of targets, yet the 'silver bullet' objective proved elusive. If anyone held the answer to this search, it should have been Albert Speer, the German Minister of Armaments and War Production. Yet in his writings and subsequent interrogation, Speer's own assessment of what constituted the critical target that could have brought Germany to earlier defeat wavers (over the course of little more than a year) from oil to coal and later to chemical and ball-bearing production facilities.

Fred Ikle is similarly uncertain when it comes to the termination of the Korean War, stating simply, *'It is still unclear what finally brought the Communists around.'*[14] Vietnam presents no less of a challenge and it may invite failure to touch on this conflict lightly. Yet the

fact remains that many accounts consider the Linebacker campaigns to have succeeded where the gradual escalation of Rolling Thunder failed with only minor consideration of the changed political situation and little, if any, supporting evidence from North Vietnamese, Soviet or Chinese source material. Finally, and despite the tremendous advances made by air forces between 1945 and 1999, particularly in terms of their ability for intelligence gathering and precision attack, the opening phase of NATO's bombing campaign against Serbia is widely regarded as a failure. The subsequent intensification and focus on targets within Serbia itself certainly corresponded with a greater willingness by Milosevic to negotiate, but whether the key factor was this shift in targeting; a growing threat of ground invasion; a reduction in Russian political support; or, more likely, a complex interplay of all these factors and others, remains a matter of conjecture.

This belief in an explicit and consistent relationship between cause and effect is the Holy Grail that underpins our 'effects-based' approach and drives the lessons identified/lessons learned industry.

Conclusion

So, is our search for strategic lessons from history doomed to failure? A number of writers certainly seem to think so, primarily due to the unique set of circumstances that surround each event. '*History is a cruel tutor. It hammers a lesson into our minds so sternly that no one dares to mention the many exceptions that must be allowed. Yet as soon as we have learned that lesson – and ignored its exceptions – history punishes us for not following another rule that posits the very opposite.*'[15] Michael Howard is similarly pessimistic, if rather more poetic, '*The lessons of history are never clear. Clio[16] is like the Delphic oracle: it is only in retrospect, and usually too late, that we can understand what she was trying to say*'[17], while Kiszely warns that '*false insights, unsound conclusions and erroneous lessons offer themselves everywhere like fools' gold to the unwary prospector.*'[18]

But it's not all bad news for history, especially if we are prepared to curtail our expectations. Indeed, without it, none of the previous analysis would even be possible. Space in this edition precludes a look at the more positive role that history can play but, if the editor will indulge me, that will be the aim of Part 2. ●

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15. Fred Charles Ikle. Every War Must End. 2nd revised edition, Columbia University Press, page vii.
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Wing Commander Anthony Stansby

started his military career in 1980 as a Seaman Officer with the Royal Navy. After qualifying as a Bridge Watchkeeper, he sub-specialised as a Fighter Controller in 1987 and gained his first operational experience with HMS Gloucester on Armilla Patrol in the Persian Gulf. In 1993 he transferred to the Royal Air Force and has since been deployed to the Falkland Islands (twice) and Iraq. Within the UK he has undertaken a number of operational, command and staff appointments, including as a Master Controller and XO at CRC Boulmer. He is a graduate of St Catherine's College, Oxford with a BA in Metallurgy and Materials Science.

Delivering Fixed-Wing Air Power Effects in a COIN Environment

By Major General Jochen Both, DEU AF, Commander, European Air Transport Command;
Colonel James Jinnette, USA AF, Director of the Air Force Element at Fort Leavenworth, KS

Air Power, used to its full potential, is a vital element of NATO's effort in Afghanistan. The International Security Assistance Force's (ISAF's) latest campaign design is based on a significant uplift of troops, coupled with an increased level of partnering between Coalition and Afghan Security forces, spread widely across Key Terrain Districts throughout four Regional Commands. It is generally accepted that this design will consequently lead to an increasing operational tempo with higher intensity of offensive operations across the ISAF Combined Joint Operations Area (CJOA), as greater insurgent interaction causes corresponding upturns in violence in contested areas. Within this Counter Insurgency (COIN) fight, the Air Component significantly contributes to ISAF's mission in a fully integrated role across all lines of operation. Accordingly, over the coming months, an increasing number of higher prioritised Joint Tactical Air Support Requests (JTARS) across Afghanistan in direct support of the Ground Force Commander's scheme of maneuver can be expected, resulting in a higher demand for Close Air Support (CAS) missions.

CAS is the utilisation of fixed-wing combat aircraft to provide timely, adaptable and effects-based assistance to friendly troops. CAS is most effective in a COIN environment through early integration into a Regional Commander's and/or Task Force Commander's operational design when used to maintain and/or re-gain the commander's initiative. During situations when friendly troops experience enemy fire[1], CAS is often the only means available to provide for their protection and frequently provides urgently-needed tactical opportunities for successful disengagement. Historically in Afghanistan, the arrival of Fixed-Wing

Dutch F-16s fly in formation.

© U.S. Air Force/MSgt Robert Wieland

An A-10 Warthog pilot from the 355th Fighter Squadron, fires his GAU-8 over the Pacific Alaska Range Complex during live fire training.

CAS aircraft overhead during insurgent attacks on ISAF has distracted the enemy from conducting offensive fires while allowing friendly forces to regain the initiative. Most importantly, CAS aircraft have provided critical effects for ground forces on patrol simply through presence. Without firing a shot, the visible support of CAS overhead has often prevented the escalation of hostilities and protected forces on the ground by demonstrating the tangible threat of force.

CAS aircrews have helped save the lives of countless ISAF ground forces. As useful as CAS aircraft have become throughout Afghanistan, however, increases in troop force levels this summer have caused commanders to face operations across the CJOA with a partnered, but nevertheless overstretched, Combined Team, especially at the Regional and Task Force levels. Analysis conducted recently indicated a need for increased numbers of CAS aircraft in Afghanistan to support the force uplift occurring during the summer of 2010. This analysis contrasted sharply with the fact that ISAF's number of available CAS aircraft fell short of SHAPE's vetted and approved requirements for CAS platforms, even when considering the additional U.S. Air Force contributions this summer.

During COIN operations, the use of kinetics, while sometimes necessary, is best avoided. The requirement to apply the Commander's guidance to protect the people during all phases of operations across the CJOA requires a strategic appreciation of challenges and atmospherics in COIN during all kinetic and non-kinetic activity, and leads to COMISAF's ultimate axiom: Avoid civilian casualties while protecting the people. While advantages of Attack Helicopter / Close Combat Attack (CCA) lie predominantly in the tactical, kinetic environment, Fixed-Wing CAS aircraft can extend the range to a

greater extent across Afghanistan, providing non-kinetic armed overwatch, and delivering precision fire when necessary to defuse hostilities with a tailorable response for the ground commander. CAS provides a remarkably flexible force-multiplier in the COIN realm. Often, the very presence of Air Power stabilises the environment and facilitates ISAF's population-centered manoeuver.

Over the past year, Airmen in Afghanistan flying in the CAS role have demonstrated exceptional discipline, restraint, and precision, which have been learned over years of development as part of the ISAF counterinsurgency effort. A combination of weekly tactics conferences, distributed Rules of Engagement tests, and CAS scenario training has produced an immensely professional Air team. In fact, some of these Air 'best practices' are now being exported throughout the theatre as ground forces grapple with the complexities of the insurgency.

Across Afghanistan today, Fixed-Wing CAS aircrews work together, along with Close Combat Attack counterparts, to provide continuous support to troops on patrol. Unlike attack helicopters, however, which are more vulnerable to surface-to-air fire due to their operating environment, Fixed-Wing aircraft bring a greater range of air effects and non-traditional intelligence, surveillance and reconnaissance capabilities across the Afghanistan area of operations. In full appreciation of the COIN environment, it is important to highlight that the employment of Fixed-Wing CAS follows the Air Component's important philosophy of centralised control and decentralised execution. This inherent close coordination with ground commanders during kinetic employment functions as a system of checks and balances. Where rotary aviation is often employed as an extension of 'direct fire,' it lacks the positive control of the CAS approval process during kinetic engagements. In COIN, that extra level of stringent control enables a more disciplined execution across a broad range of capabilities.

Fighter aircraft such as the Strike Eagle or the Tornado – which are not as threatened by insurgent offensive operations – have the freedom and speed to reach points throughout the battle space quickly, which is a key element of air power's inherent combat flexibility. The range across the CJOA, the speed of response to remote locations, the versatility and ubiquity, as well as the ability to appear and disappear rapidly and with little warning, are all strategic advantages. Of similar importance is the adaptability of CAS assets in order to shape tactical situations by delivering the desired effects for the Ground Commander. Fixed-Wing CAS can provide in one mission a variety of escalation of force measures- from Shows of Presence, Shows of Force, and supersonic passes, to the use of deadly force with a variety of weapons, ranging from the gun and low collateral damage weapons, to the largest precision-guided weapons. In summary, CAS aircraft are theatre assets which provide commanders with essential, asymmetric strengths in the COIN fight.

Currently, fast aircraft are routinely used to support planned operations in Afghanistan. While they provide daily armed overwatch for troops on patrol during ISAF's highest-priority taskings in support of COMISAF's focus areas, they remain 'on call' for

Target Point

Fixed-wing Close Air Support (CAS) has been a critical component of NATO's war in Afghanistan. CAS aircrews have saved the lives of countless ISAF ground forces through their relentless support. In order to maximise each Nation's future contribution, NATO must rethink the role that CAS assets will play in ISAF's counter insurgency effort and exploit these capabilities to their greatest effect.

urgent retasking in support of troops taking enemy fire anywhere in the country. When the calls do come, these planes are immediately dispatched from their routine patrol missions to support fire-fights throughout Afghanistan. ISAF troops in the north and west face the greatest response times, waiting longer than in other regions for CAS-capable jets to arrive overhead.

Because the number of CAS assets is limited, a limited percentage of ground commander's air requests are supported, but when troops begin taking enemy fire, that number is reduced as fighters are re-missioned for extremis support. Unfortunately, available data indicates that as force levels increase throughout the summer, the aircraft to support them will diminish on a per capita basis, resulting in longer response times for ISAF forces under fire.

Despite the demonstrated usefulness of CAS aircraft which can quickly range the full extent of Afghanistan, political constraints on troop employment and the physical realities of limited ramp space in country both limit the application of CAS to aircraft currently planned for Afghanistan. Put simply, contributing nations have supplied their maximum number of forces (including aircrew and maintenance personnel), which will politically restrict the amount of additional Air Power which can be sent to theater. Furthermore, the amount of physical ramp space available at fighter-capable bases has become tightly congested.

These two constraints taken together should persuade each nation to look carefully at what it can further contribute to ISAF's COIN effort with respect to CAS Air Power, in order to maximise each nation's contribution to the ISAF mission. The roles that all ISAF aircraft currently fill in theatre should be reconsidered carefully, to ensure they are utilised to their maximum extent. In accordance with their specific capabilities, allowing increased numbers of ISAF aircraft to augment existing CAS assets through additional involvement in CAS activities could significantly improve the success of ISAF's COIN campaign. This subtle but potentially game-changing improvement would significantly strengthen ISAF's effectiveness across Afghanistan and provide an improved level of troop support to defuse enemy hostilities, while increasing the utility of fixed-wing assets across the theater. Providing and enabling more participating aircraft to deliver low-altitude shows of force, precision strafe, and deliveries of precision-guided munitions in support of troops under attack could generate immense gains for troops from all ISAF contributing nations. ●

1. Troops In Contact (TIC)

Major General Jochen 'Joe' Both

was born on April 1st, 1954 in Brunsbüttelkoog, Germany. He is the first Commander of the European Air Transport Command in Eindhoven, the Netherlands. His previous position was the Deputy Chief of Staff Air of ISAF Joint Command, and before that he was the Chief of Staff of the German Air Force Command in Cologne, Germany. He was Wing/Base Commander for the Reconnaissance Wing 51 'Immelmann' in Kropp/Jagel and during ALLIED FORCE, he was Commander, Combat Wing 1, in Piacenza, Italy. He has also served as Commander of the German Airforce Academy, Fuerstenfeldbruck, Bavaria. He has more than 2,400 hours in the T-37, T-38, F-104G, and TORNADO and has been married since 1981 with two sons. His hobbies are sports, as well as, politics and contemporary history.

Colonel James 'JJ' Jinnette

was commissioned in the Air Force in 1990 with a Bachelor of Science Degree from the U.S. Air Force Academy. He is a command pilot with over 3,300 hours in F-15E, T-37, T-38, AT-38, and civil aircraft and has flown 699 combat hours during three deployments over both Iraq and Afghanistan. He has commanded an Air Force operational F-15E fighter squadron and has worked on staffs in the Office of the Secretary of Defense, Headquarters U.S. Air Force, and 7th Air Force. He currently leads Air Force Instructors, CGSS students, SAMS students, and SAMS Fellows at Fort Leavenworth, Kansas as Director of the Air Force Element.

The War That NATO Cannot Lose

The Impact of Culture on the Provision of Effective Force Protection for Air

By Wing Commander Jeremy Parkinson, GBR AF, JAPCC

'Geography, tribal structure, religion, social customs, language, appetites, standards were all there at my finger-ends. The enemy I knew almost like my own side'.
Colonel T E Lawrence – Lawrence of Arabia

Introduction

Culture is a complex subject and its manifestation in the operating environments where NATO finds itself today can be bewildering. An appreciation of culture is important to all who engage with the local population, particularly those forces operating on the ground whose job it is to provide Force Protection (FP) to Air Operations. The following is offered as a basic definition of 'culture':[1]

'A shared, learned, symbolic system of values, beliefs and attitudes that shapes and influences perception and behaviour. It is an abstract 'mental blueprint' or 'mental code.' It must be studied indirectly by studying behaviour, customs, tools, technology and language.'

Perspectives – Joint Versus Air

There is always discussion at the NATO School in Oberammergau during FP courses over how the different components view FP. Whilst every attempt is made to make courses as Joint as possible, even those staff supporting the courses from Joint Headquarters typically come from Air Force backgrounds. The fact is that NATO FP expertise developed in the Air Component during the Cold War as a result of it being extremely difficult, if not impossible, to move an airbase.[2] The Air Component has always had to fight from, and defend, fixed *'Main Base'* locations[3] and cannot, unlike the Land Component, use 'manoeuvre,' in its broadest context, as an

FP measure. Indeed, acceptance is growing that Air FP Doctrine is as applicable to any 'static object' as it is to an airbase. However, the argument remains that whether defending an airbase or a Forward Operating Base, an understanding of culture remains essential; the more detailed the understanding, the more likely it will be that the FP measures will be effective.

'Relationships will not be established and trust will not develop if FP forces fail to understand their operating environment, a large part of which is local culture.'

Airbase Force Protection

Unless there is a radical re-think on how the Alliance both plans and funds its operations, the Air Component will be forced to use airbases that a Host Nation (HN) either offers, or which NATO can itself secure access to.[4] Therefore, it is likely that for the foreseeable future,NATO airbases will be either military or commercial facilities in, or close to, centres of population. [5] In his 2005 book *The Utility of Force*, General Sir Rupert Smith stated:

'War amongst the people is different: it is the reality in which the people in the streets and houses and fields – all the people are the battlefield … Civilians are the targets, objectives to be won, as much as an opposing force.'

Given that we cannot move an airbase, FP has to take account of the 'battlespace' as it exists in and around that base. A critical element of this is to have an understanding of the local population and its culture and the adage:[6] *'Time spent in reconnaissance is seldom wasted.'* This applies equally to understanding and then accurately mapping the human terrain, as it does to more traditional elements of the Intelligence Preparation of the Battlefield (IPB). We must also note that the human terrain will change over time and that some of this change is likely to be as a result of NATO's presence. The presence of a base in any area of a failed or failing state is likely to attract the local population seeking everything from protection and humanitarian relief to employment. As a result, we need to both fully understand the developing cultural dynamic and the needs of the population in order to respond appropriately if we are to have any hope of maintaining the trust and support of the local population.

© Canadian Forces Combat Camera/Master Corporal Angela Abbey

Door Gunner provides security from a CH-146 Griffon helicopter during an escort mission.

Force Protection Delivery

Before discussing culture and its impact on the FP of airbases, the first major challenge to be addressed is actually how Air delivers FP for its deployed forces. Currently few NATO nations have specialist FP units within their Air structures. Whilst attempts are being made to address this matter through a NATO FP Capability Development initiative[7], the fact remains that it is only now starting to be recognised that airbase commanders need to not only 'own' the airbase itself, but also all of the ground of tactical significance to the defence of the base and air assets operating into and out of the base as well. In some cases where one or all of a Surface to Air Fire (SAFIRE), Man-Portable Air Defence System (MANPADS) or Indirect Fire (IDF) threat exists, this area may extend out to some 20+ kilometres from the centre of the base and the total area may cover many hundreds of square kilometres. Furthermore, the Base Commander needs to have dedicated forces available to be able to deliver a full spectrum of kinetic and non-kinetic effects within his Ground Defence Area[8] (GDA).

To be truly effective, any force responsible for a GDA must not only be 'air minded'[9] but also be specially trained to deal with the unique set of conditions they will encounter in providing FP to an airbase.[10] The protection of air assets from SAFIRE or MANPADS threats requires the ground Force Element (FE) to regularly patrol the areas which aircraft must over-fly, on approach or departure, to the base and from where an attack on an aircraft or the base could be initiated. Over a protracted period, this cannot help but lead to an element of 'pattern setting' by any FE. Equally, it is not just aircraft on approach or departure, but also aircraft on the ground, personnel, equipment and logistics supplies within the base that are vulnerable to both direct and indirect attack. Therefore, the entire GDA must be dominated in order to provide an appropriate level of FP to the base at its centre. Whilst a GDA may initially seem a large piece of real estate, in 'Land' terms, it is a relatively confined battlespace; a fact that is compounded by the potential need to provide FP to a base over many years and making *'Campaign Continuity'* between rotations essential.

The Impact of Culture

Having briefly outlined how emerging NATO doctrine sees airbases being provided with FP, why should an understanding of culture be such a fundamental

issue? The answer to this lies in the fact that Air FP forces' actions are geographically more constrained than traditional 'Land' forces,[11] and their activity is driven by the need to maintain the tempo of Air Operations. Therefore, Air FP forces must work with the local population in order to achieve their effect. This can only be done through building trust and establishing working relationships at all levels, including HN security forces[12]. Relationships will not be established and trust will not develop if FP forces fail to understand their operating environment, a large part of which is local culture. The importance of understanding of culture in providing FP can probably be best exemplified by a number of vignettes:

Target Point

Air Operations need Air Bases and the NATO Air Component is likely to have little choice where those bases are; they will be pre-existing military or commercial facilities. Given this lack of choice, we must make the best use of what we are given and to do this we need to shape the environment around the base to our advantage. How can we do this effectively if we do not understand the local culture?

In large parts of the world, the male in society views himself as a warrior (or hunter) and it remains the case that part of a boy's journey to manhood is demonstrating his ability to hunt or fight. In such societies it is often the case that mounting an attack is more important than the effect of the attack. An understanding of this facet of culture will lead to a balancing of FP measures between passive measures to protect against attack, such as hardening of sleeping accommodation or places of mass gathering,[13] and active measures such as patrol activity to deter or disrupt an attack. In being too effective in preventing attacks on an airbase, a FE operating in the GDA could themselves become the target for attack particularly if society sees any foreigner as a potential invader and/or society has developed in a culture of conflict. Therefore, achieving a balance between 'active' (patrol activity) and 'passive' (protection measures) is key, and an understanding of the cultural dynamic is essential.

In the analysis after any attack, an attempt to answer the question of *'why an attack was mounted?'* should always be made. It is all too easy to believe that we are being attacked because that is simply what an enemy does! In the case of providing FP to an airbase and operating within a GDA, has our interaction, or indeed lack of appropriate interaction, with the local population, brought about an attack? Has the local population allowed the enemy freedom of manoeuvre or have they actively facilitated an attack because of something we have done? There are numerous possibilities here, from inadvertently damaging buildings, destroying crops, or injuring livestock, to contaminating water supplies or injuring civilians in road traffic accidents.

How a particular culture views time also needs to be considered. The saying, *'You don't get a second chance to make a first impression'* is appropriate as a mistake once made, even if immediately identified is often hard to rectify, and impossible to rectify without an understanding of local culture. An action by a FE today will have immediate and probably readily identifiable effects; but are there any longer-term, unintended consequences? Within the Alliance, the appetite for risk varies between Nations and it could be argued that in some cases, in attempting to provide the best possible FP for their forces, some measures are actually having a negative effect, e.g. the need to patrol in armoured vehicles. It is highly likely that a number of potential examples could be found where the use of armour, which has in turn damaged buildings or crops or indeed '*isolated*' the FE from the population, is likely to have led directly to attacks on FP forces. A better option, but one requiring an initially greater appetite for risk, could have been the use of smaller, soft-skinned vehicles or indeed foot patrols in order to engage with the local population. The problem in identifying the actual motivations behind any attack in a GDA is that the incident which triggered the chain of events may have taken place many months previously. A valuable thought process is attempting to analyse how actions today will affect the local population and how they might respond in the longer term; how will my actions today affect those who follow on the next or even next rotation? Again, what is required is *'Campaign Continuity'* with a plan that transcends the boundaries between individual FE tours of duty.

In an impoverished culture the impact of causing damage to crops should not be underestimated. In Afghanistan, the poppy crop is, in the majority of cases, simply the means by which a farmer can best provide for his family and nothing more. The difficulty of any strategy that seeks to eradicate the poppy is that a farmer can earn significantly more growing poppies than he can from growing any other crop, and damaging crops (of any type) within a GDA will inevitably lead to attacks either on the airbase or on FP forces. Perhaps we should not be looking to eradicate the poppy but exploring how to take control of its production and processing, and by so doing turn what is currently the supply of illegal drugs to Europe into a supply of medical products to Africa. Only by controlling supply and demand for any existing crop can we manipulate and subsequently re-direct the agricultural sector over the medium to long-term. Is this not what is meant when we in NATO talk about a 'Comprehensive Approach'?

Understanding the role of the female in society is also important. In the case of Afghanistan, 49% of the population is female. Male children stay with their mothers until approximately the age of 15 and female children stay with their mothers until they get married. It should be obvious that one way to 'cut-off' the supply of *'fighting age males'* is to properly engage with the female population. This requires not just a thorough understanding of the place of women in Afghan society, but perhaps a change in our own culture in how we employ female personnel in our armed forces.

Conclusion

Clearly, the vignettes above describe issues which could manifest themselves anywhere. It is simply the fact that within the context of providing FP for Air Operations, they manifest themselves more acutely in the confines of a GDA. We cannot avoid their consequences by moving our operations. This piece has only touched the surface of the issue of culture but as the basic definition of *'culture'* hopefully indicates by the subjects it touches, we cannot hope to be effective if we do not truly understand the local culture within which we operate. Whilst the context may be different, the lessons identified by Lawrence in his *'Seven Pillars of Wisdom'* still hold true for the FP of Air Operations. ●

1. A considerable number of definitions exist. A simple Internet search of 'culture definition' will reveal many; the one offered here is a simple, un-attributed version.
2. The term 'air base' is specifically used as in some nations the term 'air field' is used to refer to an army run facility.
3. It is accepted that air assets will on occasion operate 'off base' with appropriate FP and technical support but this article focuses solely on the 'Main Base'.
4. It is assumed unlikely that NATO will construct its own airbases in order to avoid having to use existing facilities.
5. Accepting that as technology delivers ever longer endurance (particularly Unmanned Air Systems (UAS)), the ability to undertake some (but never all) missions from bases remote from the conflict increases.
6. Variously attributed to Sun Tzu and Napoleon.
7. Accepting that developing new structures and capabilities in the current economic climate will be difficult.
8. The GDA starts at the centre of any airbase and extends out to include all ground of tactical significance as described in the main body text.
9. Air-mindedness is an approach that sets the context for air operations, maximising effectiveness and minimising fratricide and accidents (AP3000 (4th Edition) British Air and Space Power Doctrine).
10. Because air and spacecraft are scarce, expensive and fragile, and operating bases are also potentially vulnerable if they are located in a hostile, non-linear battlespace, a specialist, air minded FP capability is required to mitigate the strategic consequences of the loss of air freedom of manoeuvre, or of a key air platform (AP3000 (4th Edition) British Air and Space Power Doctrine).
11. By the boundaries of the GDA which are themselves fixed to a static object.
12. The training and mentoring of whom may well be part of a NATO 'Exit Strategy'.
13. Places such as dining facilities and gymnasiums.

Wing Commander Jeremy Parkinson

is a Regiment Officer who joined the RAF in 1986. He is currently working at the JAPCC at Kalkar, Germany, where he is the Force Protection and Defence against Terrorism Subject Matter Expert. He has a broad background in Force Protection, completing operational tours in the Middle East, the Balkans and Northern Ireland. His current projects include NATO Doctrine for the Force Protection of Air Operations, Countering Air Orientated Terrorism and NATO Air Force Protection Capability Development. His interest in the cultural elements of Force Protection stem from the study of the complex nature of conducting multinational operations and the fact that airbases are immoveable, and as such, the local population surrounding such facilities has a significant impact on their operation.

Captain Jason Simmons, left, and Staff Sgt. Clinton Tips update anti-virus software for Air Force units to assist in the prevention of cyberspace hackers at Barksdale AFB.

Warfare at the Speed of Light:

Is NATO Ready for Cyberwar?

By Lieutenant Colonel Mike Delorey, CAN AF, JAPCC

'It is thus more potent, as well as more economical, to disarm the enemy than to attempt his destruction by hard fighting … A strategist should think in terms of paralyzing, not of killing.'[1]
Sir Basil H. Liddell Hart

Introduction

The Internet as we know it today traces its roots back to the ARPANET (Advanced Research Projects Agency Network), conceived by the United States government in the 1960's to meet an emerging need to connect research institutions and facilitate the transfer of digital information. In the 40+ years since the first routing switch was turned on, the very tenets that inspired the ARPANET still hold true for the Internet of today: the desire for open and free access to information; seamless connectivity between users; and highly-assured communication via robust and multiple self-supporting network routes.

History will show that the Internet has impacted humanity's perception of the world in a way not seen since the discovery of the New World by Christopher Columbus. Assured access to the services provided using the Internet has become so pervasive across all aspects of military operations within NATO and its member Nations that protecting this capability will remain critically important to the modern warfighter for the foreseeable future.

Indeed, the general acceptance of the notion that winning the next war might be achievable solely through dominance of Cyberspace has translated to a growing acknowledgment of Cyberspace as the Fifth Domain of warfare.[2] Recalling the early days of aviation and the initial efforts to understand and exploit the Air Domain as a tool of warfare, one can identify similarities in the urgent efforts by Western military forces to define and integrate Cyberwar capabilities into their order of battle. NATO has implemented a mature Cyber Defence posture, but is this sufficient to permit NATO Freedom

of Movement during a conflict within Cyberspace? Could this impact NATO's ability to conduct operations in the Maritime, Land, and Air Domains?

Whither Cyberspace?

Despite the relatively recent emergence of Cyberspace and Cyberwar as dominant terms within our military lexicon, the reality remains that the ability to 'attack' military and other significant information systems has existed ever since the first computer viruses appeared in the late 1970's. The reported sabotage of a Russian pipeline by the West in 1982 is a non-internet example of using Cyberspace to achieve Strategic-level effects[3]. It is only in recent years, however, that Cyberspace has completed an evolution from primarily a CIS/J6 concern (Information & Network Services support) to an activity within Information and Influence Operations (CNO and EW/SIGINT), and finally to its current stature as a standalone Domain within which full-spectrum Operations can be planned and conducted.

Yet, there still exist a paucity of sources for Cyber-related terminology. NATO's terminology bible, AAP-06, does not yet contain an agreed upon NATO definition for anything containing the word 'Cyber'[4]. The U.S. Department of Defense (DoD), which has taken a leading role with respect to Cyber-related definitions, classifies Cyberspace as 'A global domain within the information environment consisting of the interdependent network of information technology infrastructures, including the Internet, telecommunications networks, computer systems, and embedded processors and controllers.'[5] This definition is excellent in that it provides a tacit reminder that Cyberspace is more than just the Internet and its sub-components, but rather a broader space issue which encompasses the entire range of IT elements.

NATO's Current Cyber Strategy

NATO's Cyber Defence Program was officially launched in 2002 at the Prague Summit, but interestingly, the primary reason was to ensure NATO's Cyber infrastructure was protected against a cyber terrorism event and not an attack by a military adversary.[6] In the eight years since, the NCSA (NATO CIS Services Agency), with the support of NC3A (NATO Consultation, Command and Control Agency), has implemented a robust Cyber defence capability, with the sole aim of protecting NATO's telecommunications and computer networks and denying unauthorized access to NATO information across all security domains.

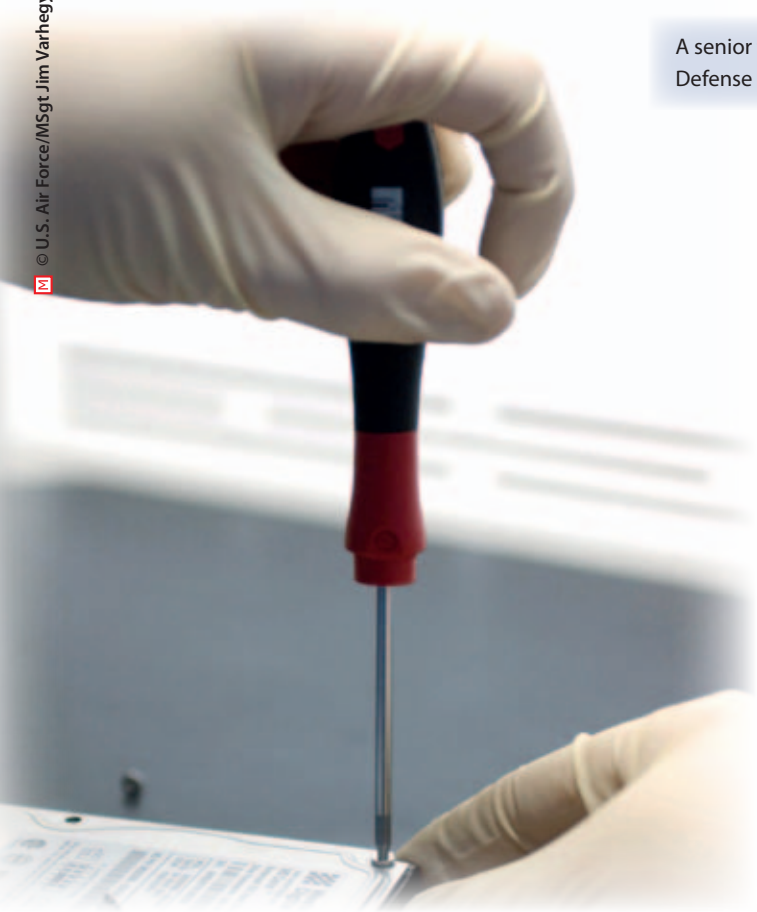
NATO has stood up an operational Information Security Operations Centre and a Computer Incident Response Capability Technical Centre, both operating 24/7 to provide oversight and management of NATO's Cyber security resources, as well as a real-time detection, response, and recovery capability against attempted intrusions into NATO's Cyber footprint. In 2008, NATO stood up its Cooperative Cyber Defence Centre of Excellence (CCD CoE), which has further enhanced NATO's cyber defence planning capability.

Target Point

Cyberspace has emerged as a separate domain of war. As a result, many NATO members have distinct Cyber forces capable of conducting independent full spectrum Cyber Ops. NATO currently limits its Cyber capability to strictly Cyber Defence activities. As a result, the ability of NATO to C2 forces in the face of a concerted and sustained state-sponsored Cyber Attack is questionable and requires serious examination.

Dominance within any of the warfare domains can simply be described as the achievement of full friendly freedom of movement while denying adversarial freedom of movement. In general, this requires the ability to: **Defend** friendly assets against enemy action within the domain; **Shape** the Domain itself, which includes the identification of enemy capabilities and intent; and **Attack** enemy assets as required to destroy and degrade their capacity to wage war.

In order to explain this further, a number of definitions are useful. I offer the following four definitions (based on the U.S. DoD definitions for CNO):



© U.S. Air Force/MSgt Jim Varhegyi

A senior forensic repair technician works on a computer at the Defense Computer Cyber Crime Center (DC3).

Cyber Operations – The conduct of military activities within Cyberspace. Cyber Operations are comprised of Cyber Attack, Cyber Defence, and related Cyber Shaping Operations.

Cyber Shaping – Operations and activities conducted within Cyberspace for the purposes of intelligence collection and/or preparation of the cyberspace, short of Cyber Attack.

Cyber Defence – Actions taken within Cyberspace to monitor, respond, analyse, detect, and protect friendly Cyberspace assets against unauthorised and unwanted adversary activity.

Cyber Attack – Actions taken within Cyberspace to intentionally disrupt, deny, degrade, or destroy any portion of an adversary's Cyber capability.

The Fog of Cyber War

The fact that NATO Policy explicitly limits NATO to Cyber Defence activities raises many concerns of whether NATO can maintain effective C2 of forces under its command in the face of a concerted and sustained Cyber Attack. Based on the model provided above, the answer would seem to be no. Referring to Figure 1, each facet of Cyber Operations is inter-dependent on the activities, effects and information derived from the others, thus, it appears that the NATO Military Command Structure would quickly lose its freedom of movement within Cyberspace during an attack.

At first glance, NATO's Cyber Defence capability would appear to fall squarely within the **Defend** category, but can such a clear distinction be made? The continuing inability to agree on an international legal framework for Cyber Operations (the most difficult being the parameters to define what constitutes a 'Cyber Attack') only serves to perpetuate the broad and distorted boundaries which currently exist between the three categories of Cyber Operations. This is of prime importance for NATO when considering the Policy-imposed limitation to Cyber Defence activities. Ambiguity on these boundaries raises the issue of whether NATO Cyber Defence Forces would be able to obtain authorisation to use Cyber Shaping (or even Attack) tools to support NATO's Cyber Defence requirements should threat levels rise.

Limitations on the size of this article preclude any deliberate discussion of the interactions and dependencies between Cyberspace and the other Domains. There are direct linkages with Air Power, however, which are worth noting. Cyberspace offers many opportunities for an adversary without Air assets to disrupt or degrade Alliance Air Power, fully reinforcing Sir Liddel-Hart's assertion as quoted at the beginning of this article. Conversely, Air Power's contribution to the Cyber fight has a long history and a bright future. Moving beyond the traditional Electronic Warfare and kinetic effects capabilities against Cyber targets, modern attack aircraft now possess the technological ability to deliver 'electronic bombs', in effect, becoming a piloted 'Cyber Weapon'.[7]

A Way Forward for NATO

So is NATO ready for Cyberwar? Against a determined state-sponsored adversary, the answer is no. The last eight years, however, have seen the implementation of a robust and multi-faceted Cyber Defence capability, which is prepared to meet the real world Cyber challenges faced

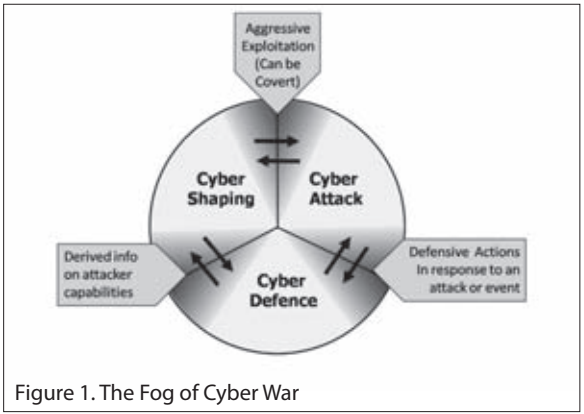


Figure 1. The Fog of Cyber War

by NATO today. The on-going and most-likely threat today remains one of espionage, threatening critical information which could ultimately be pulled from our networks without our knowledge. However, the speed and intensity of a full-blown Cyber Attack means that this is the most dangerous threat to NATO. There will be no time for consultation and review after a Cyber Attack on NATO assets, therefore, certain actions must be completed to assure NATO readiness in Cyberspace.

First and foremost, this author is not advocating that NATO establish a 'NATO Cyber Command', replete with an organic Cyber Attack and Cyber Shape capability. The ability to conduct full-spectrum Cyber Operations within many NATO Nations, however, is maturing very rapidly and is a capability which should be exploited by NATO Commanders. Current NATO policy precludes the integration of full-spectrum Cyber Operations into NATO military planning, therefore, the first apparent solution in overcoming this deficiency is to leverage the current NATO Strategic Review to comprehensively address full-spectrum Cyberspace and Cyber Operations capability requirements within the NATO Command Structure.

If political consensus is reached, a number of legal issues would need to be addressed. For example, a NATO Cyber Policy must be developed, and agreement would need to be reached on the terms for which a Cyber Attack would meet the terms of Article V in the NATO Treaty. Once NATO has decided to respond to a Cyber Attack, the parameters of a graduated response within Cyberspace would need to be defined.

Within the NATO Military Command structure itself, there will need to be a cadre of Cyber Operations professionals incorporated throughout the NATO Strategic and Operational Command structure. Again, within this construct, there would be no NATO Cyber Attack or Cyber Shaping forces per se, as the real need is to empower NATO Commanders with the ability to plan and conduct full-spectrum Cyber Operations using Nationally-contributed Cyber Forces within a Joint NATO-led Operational construct. A natural benefit of this will be the closer coordination between National Cyberspace forces and NATO Cyber Operations professionals.

Conclusion

As Nations within the Alliance race to stand up Cyber Operations Forces, NATO military commanders continue to be faced with a dilemma. On one hand, the NATO Command Structure is already assuming that future operations will most likely span all five Domains, including Cyber. On the other, Current NATO Policy places significant limitations on the ability of NATO commanders to maintain the initiative, or to even maintain freedom of movement, should the next conflict involve the Cyber Domain in any significant manner. No one can predict when this next conflict will occur, however, history tells us that it is inevitable that the Cyber Domain will eventually be contested. Only the future will show whether NATO has adopted the necessary Policy and Command Structure changes required to be relevant in a future Cyber war. ●

1. Sir Basil H. Liddell Hart, quoted in http://www.military-quotes.com/
2. The other Domains are Air, Land, Maritime, and Space.
3. The resulting explosion caused by the induced malfunction of a pipeline control switch produced the largest non-nuclear event up to that point in history. See War in the fifth domain; Cyberwar. 2010. The Economist, July 3, 25–28. http://www.proquest.com/ (accessed July 27, 2010).
4. AAP-06 does contain a definition for Computer Network Attack (CNA) which includes a note acknowledging that CNA 'is a type of cyber attack'.
5. http://www.dtic.mil/doctrine/dod_dictionary/
6. http://www.ncsa.nato.int/topics/combating_cyber_terrorism.htm accessed 25 July 2010
7. The F-22, F-15E, EA-18G, F/A-18F and F-35 can all be upgraded with this capability. See Fulghum, D. 2010. Cyberwar Confusion. Aviation Week & Space Technology, April 19, 36. http://www.proquest.com/ (accessed July 27, 2010).

Lieutenant Colonel Mike Delorey

is a Communications and Electronics officer with the Canadian Forces. He holds a Master's degree in Computer Engineering from the Royal Military College of Canada, and is a graduate of the Canadian Forces Command and Staff College. The highlight of his career was in 2003, when he was Commanding Officer of Canadian Forces Station Alert, the world's northernmost, permanently inhabited location. Lt Col Delorey has been a member of the C4ISTAR Branch of the JAPCC since 2008.

JAPCC and EADTF Sign Cooperation Agreement

The Joint Integrated Air & Missile Defence Study (JIAMDS) Project is one of the JAPCC's 2010 primary projects. The project focuses on developing a vision for the future of NATO Air Defence. The development of this project is not only conducted by organic JAPCC Subject Matter Experts, but also by experts external to the organisation.

To strengthen the JAPCC's Air Defence knowledge base, the Assistant Director of Capabilities (ADC), Air Commodore Jan van Hoof, Royal Netherlands Air Force, signed a cooperation agreement with the Commander of the Extended Air Defence Task Force (EADTF), Colonel Kopf, from the German Air Force.

The EADTF is a German-Dutch military organisation with approximately 20 personnel working alongside HQ CC-Air Ramstein. Their focus is on supporting NATO's Integrated Air Defence mission, particularly in the area of theatre missile defence. Increasing interest in missile defense will possibly encourage more countries to join the organisation. JAPCC cooperation provides the EADTF access to NATO's Air & Space Competence Centre network. ●

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NATO AWACS Controls an Unmanned Airborne System

By SMSgt Johan Hijmenberg

A NATO AWACS detachment consisting of 60 Operations and Logistics personnel, Force Command and NC3A elements and the Boeing Company, participated in Exercise Empire Challenge from 26 July–13 August 2010. The purpose was to demonstrate the control of the ScanEagle Unmanned Airborne System (UAS). The event was hosted by the U.S. Joint Forces Command at Fort Huachuca, Arizona, while the NATO AWACS E-3A flew out of Nellis AFB, Nevada.

Empire Challenge brought together 2,000 international participants in a live, Joint and Coalition exercise. The flight demonstration paved the way for any airborne Command and Control (C2) platform to control UASs as remote Intelligence, Surveillance and Reconnaissance (ISR) sensors without requiring major modifications to the controlling aircraft. UASs and AWACS have been tested in previous Empire Challenge demonstrations, but this was the first time NATO AWACS demonstrated full control of a UAS by an airborne C2 platform during

an operational scenario. 'The ScanEagle UAS allows C2 agencies to receive real-time, high quality imagery in both the ground and maritime environments,' states Major Mark Youkey, a system project officer. 'The deployment existed in three phases. The first phase involved deploying a tail to the Boeing Company in Seattle, Washington, to have the ScanEagle control station installed on the aircraft. Once this was completed and tested, the second phase involved moving the jet to Nellis AFB, Nevada, to participate in Empire Challenge 2010, utilising ScanEagle and other systems aboard the E-3A to provide the real capability to find, fix, track, target, engage, and assess tracks of interest. The final phase of the deployment involves returning the jet to Seattle to have the ScanEagle equipment removed from the plane.'

The mock scenario included a counter-piracy operation in which the E-3A detected suspicious activity and directed ScanEagle to fly to a location and track a suspect vessel – a vehicle representing a pirate ship – while sending real-time video back to the AWACS. The E-3A, in collaboration with the Combined Air Operations Centre (CAOC), determined whether the 'vessel' was a threat and directed other coalition assets to respond appropriately. The aircraft was equipped with a Tactical Common Data Link system, which relayed commands to the ScanEagle from an onboard operator. This information would then be passed on to the CAOC for further execution of the track of interest. 'The tests have gone much better than anticipated,' adds Major Youkey. 'The crew performed extremely well, and employed the brand new experimental system at a combat-ready level. During the missions, several surveillance taskings were successfully performed in support of ground troops, including convoy route recce and forward operating base surveillance. Additionally, all the new systems were employed in an integrated fashion; the AIS detected a suspected pirate ship, CHAT was then used to coordinate with the CAOC, and the ScanEagle provided a positive identification and ensured collateral damage would be avoided. The AWACS then controlled F-16s to the target, ScanEagle provided a poststrike assessment, and the results were relayed to the CAOC via CHAT. Other aircraft, such as JSTARS and Rivet Joint, were also integrated into several missions through Link 16, and enabled, by cross-cued sensors, to find and sanitise targets, with the results being immediately relayed to the ground via CHAT. These capabilities were expanded further into night missions, using ScanEagle's night detection and surveillance capabilities.' Linking NATO AWACS with other sensor platforms provides new opportunities in the fields of air battle management, Joint ISR and refined information sharing methods to harness operational asset and network synergies. The accelerated data exchange between ScanEagle and the AWACS aircraft will not only mean improved observation angles from both higher and lower altitudes, but also shortened response times based on immediately actionable intelligence. ●

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Fax. +49-6561 9498-9449
email: walter@euro-composites.com

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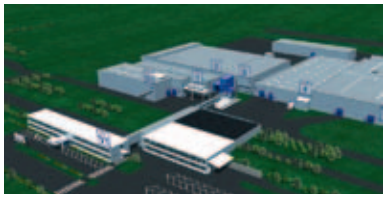

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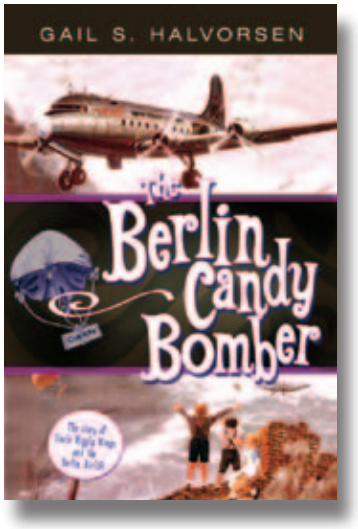
‘The Berlin Candy Bomber’



By Gail S. Halvorsen
Published by Cedar fort, Inc.
Reviewed by:
Colonel Roberto Sardo
ITA AF, JAPCC

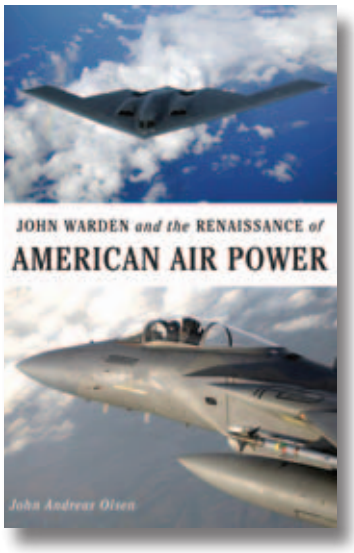
This exciting book reflects on the historical events of how the Berlin Airlift and the resolute Berliners broke the Soviet siege of West Berlin in 1948 and 1949. Gail Halvorsen, a pilot who flew in the airlift, gives a firsthand account of this amazing event. His experiences and feelings are on full display and the accolades received from fellow aviators and military officers at the Airlift Tanker Association last year were well earned. I especially appreciated the testimony provided by the German children, now fully grown, who received the food from these missions.

I would be remiss in not providing information to help future readers enjoy this wonderful book. The book can be obtained from Gail S. Halvorsen at 19 E Southfield Road, Spanish Fork Utah 84660 from 1 May to mid-December, and 1525 Dove Way, Amado, AZ 85645 from mid-December to 30 April and only costs $20.00. Indicate in your reply that you are responding to this review and a donation of one dollar will be made by the author, on the sale of each book, to each of the following organisations: Berlin Airlift Veterans Association, the Berlin Airlift Historical Foundation and the Primary Children’s Hospital in Salt Lake City, Utah. This offer is limited to the first 1,400 books.

‘John Warden and the Renaissance of American Air Power’

John Andreas Olsen’s ‘John Warden and the Renaissance of American Air Power’ is an in-depth examination of the significance of operational and strategic thinking in the application of air power. The book is based on the career of Col John Warden, USAF, and traces his life to elements of strategic theory and military history.

This book presents a fascinating glimpse at why Col Warden was, and still is, such a studied figure for U.S. and worldwide military leaders and tacticians. While focusing less on Warden’s early career, the reader is able to focus more on the development of Air Power and how Col Warden was able to redefine it through his operational decision-making. Col Warden’s reputation as a divisive figure extends beyond U.S. borders and provides militaries around the world with important learning tools to develop their own perspectives on air power. By looking through this air leader’s eyes, NATO officers can shape their own discussions about the role of air power at all levels of war. The use of Air Power examples during operational conflicts, such as the Gulf War, provides readers with a thorough analysis which can translate to ISAF and beyond.



John Andreas Olsen
Published by Potomac Books, Inc.
Reviewed by:
Lieutenant Colonel Marc Scheers,
BEL AF, JAPCC

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