



Transforming Joint Air Power The Journal of the JAPCC



© Jan Kouba 2012

Edition 16, Autumn/Winter 2012

PAGE 6

Active Role in NATO Comes in All Sizes

Interview with Brig Gen Jiří Verner, Chief of Staff of the Czech Air Force

PAGE 19

NATO's Helicopter Capabilities

The Need for International Standardisation

PAGE 39

Happy Marriage But Still With Sorrow

Air-to-Air Refuelling and Interoperability

“Man will never reach the moon regardless of all future scientific advances.”

Dr. Lee DeForest, Radio Pioneer, 1957

Whilst not all predictions are as bold or naïve as the one above, the lesson is history has taught us that predicting the future with much certainty is fraught with difficulty. Likewise, knowing where or when the next conflict will arise or who it will involve is just as problematic. Nonetheless, if current trends are any indication, we can be fairly confident that forthcoming military operations will involve a multi-national and multi-institutional effort. In today's complex security environment and with the fatigue of Afghanistan still fresh, nations will endeavour to *prevent* a future drawn out, 'boots-on-the-ground' struggle. With current fiscal limitations, this is understandable, but quick, decisive action, whether kinetic or non-kinetic, will still be needed. As we saw in Libya, Air and Space Power is uniquely suited for such a strategy.

With this in mind it is my pleasure, as the new Executive Director of the Joint Air Power Competence Centre, to reveal the sixteenth edition of the JAPCC Journal. We begin this edition with an interview with Brigadier General Jiří Verner, Chief of the Czech Air Force; whom we are indebted to for providing a privileged insight into developments within the Czech Air Force whilst also stressing the exceptional importance of Air Forces in military operations. Later we take a look at the Czech approach to maintaining a viable Ground Based Air Defence (GBAD) capability through modernisation and the possibilities of cooperation with neighbouring nations as a 'Smart Defence' opportunity.

In our Viewpoints section we build momentum with Smart Defence and/or Pooling and Sharing concepts with differing perspectives. Major General

Jochen Both's interview cites the European Air Transport Command (EATC) as a successful example of the pooling and sharing initiative whilst the following article focuses on Air-to-Air Refuelling, revealing both the broader political and practical military challenges. The latter suggesting that if nations are not willing or able to 'pool and share' their individual efforts to resolve the smaller issues, then there is little prospect of advancing the more ambitious projects and address the collective capability shortfalls.

I am particularly grateful to Dr. Griethe for his interesting article on laser based satellite communication for use in the high-altitude Unmanned Aerial Systems (UAS) domain. This emerging technology has the potential to enhance Intelligence, Surveillance and Reconnaissance (ISR) capability at a time when the demand for, and importance of, unmanned systems continues to grow. Elsewhere in this edition we look at enhancing NATO's operational helicopter capabilities as well as the notion of expanding the role of the AWACS weapons system. We learn about potentially new Chemical, Biological, Radiological and Nuclear (CBRN) threats, discuss the challenges of Suppression of Enemy Air Defences (SEAD) in future campaigns, and peek at Hybrid Warfare as an out of the box viewpoint.

Finally, I urge you to let us know what you think by completing a very short online survey at <https://www.surveymonkey.com/s/JAPCC>. Your feedback is vitally important to ensure that the Journal continues to evolve to meet your requirements.



The Journal of the JAPCC welcomes unsolicited manuscripts. Please e-mail submissions to: articles@japcc.de

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

Current and past JAPCC Journal issues can be downloaded from www.japcc.org

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

Joachim Wundrak, Lieutenant General, DEU AF
Executive Director, Joint Air Power Competence Centre



15



19



29

Table of Contents

Transformation and Capabilities

- 6** An Active Role in NATO Comes in All Sizes – The Czech Air Force
An Interview with Brigadier General Jiří Verner
- 11** Laser Communication
Exciting UAS Emerging Technology
- 15** Expanding the Role of NATO AWACS
Reducing the Mission Execution Chain
- 19** Enhancing NATO’s Operational Helicopter Capabilities
The Need for International Standardisation
- 24** Is There a New CBRN Threat for NATO?
- 29** Looking at Our Past
SEAD Factors of Influence

Viewpoints

- 34** The European Air Transport Command – A Successful Example for Pooling and Sharing
An Interview with Major General Jochen Both

- 39** A Happy Marriage But Still With Sorrow
Air-to-Air Refuelling and Interoperability
- 45** Too Good for Comfort?
Air Power’s Battle Against Rising Expectations
- 49** NATO Logistics Doctrine
Making it Relevant
- 54** Making Ready: Practical Considerations for Space Coordinating Authority
- 59** Avoiding the GBAD Gap
The Czech Approach

Out of the Box

- 63** Hybrid Warfare
Air Power and the Narrative



6



11



Copyrights

Left column top: © NATO ACO PAO
Far left column bottom: © NATO/ISAF, MAITRE (OR7) Christian Valverde (FRA N)
Middle column bottom: © U.S. Navy, Jamie Hunter/Aviacom
Right column top: © Jan Kouba 2012
Right column bottom: © U.S. Air Force

Inside the JAPCC

68

A Note From the JAPCC Editor

European Air Transport Training 2012 (EATT 12)

Shriever Wargame

JAPCC Improvement Campaign: Strategic Cooperation with EUMS

Book Reviews

71

'7 Deadly Scenarios: A Military Futurist Explores War in the 21st Century'

'NATO 2.0: Reboot or Delete?'

Imprint:

**Transforming Joint Air Power:
The Journal of the JAPCC**

Director

Joint Air Power Competence Centre
Gen Philip Breedlove

Executive Director

Joint Air Power Competence Centre
Lt Gen Joachim Wundrak

Editor

Brig Gen Alessio Cecchetti

Project Leader

Col Gustavo Cicconardi

Deputy Editor

Maj Ron Glovach

**Production Manager/
Advertising Manager**

Mr. Simon Ingram

Editorial Review Team

Cdr(N) Tim Fitzpatrick
Cdr(N) Arndt Neumann
Lt Col Roger Efraimssen
Lt Col Heiko Hermanns
Wg Cdr Richard Wells
Maj Jason Hunt
Maj Chad Taylor
Maj Phil Verroco
Maj Frank Ziolkowski
Sgt1 Björn Aarts
Sgt1 Lilian Brandon

Releasable to the Public

This Journal is the professional publication of the JAPCC and aims to serve as a forum for the presentation and stimulation of innovative thinking on Air and Space Power related issues such as doctrine, strategy, force structure and readiness. To find out more, access the JAPCC website at www.japcc.org.

Disclaimer

The views and opinions expressed or implied in The Journal of the JAPCC are those of the authors and should not be construed as carrying the official sanction of NATO.

All articles within this issue not bearing a copyright notice may be reproduced in whole or in part without further permission. Articles bearing a copyright notice may be reproduced for any NATO purpose without permission.

If any article is being reproduced, The Journal of the JAPCC requests a courtesy line. To obtain permission for the reproduction of material bearing a copyright notice for other than NATO purposes, contact the author of the material rather than The Journal of the JAPCC.

 Denotes images digitally manipulated



An Active Role in NATO Comes in All Sizes

The Czech Air Force

An Interview with Brigadier General Jiří Verner,
Chief of Staff, Czech Air Force

Sir, it's been over three years since you were appointed to the position of Deputy Commander of Joint Forces – Air Force Commander. How would you summarise this tenure?

I came to the position of deputy Joint Force Commander – Air Force Commander from the position of Director of Development Department of the Air Force General Staff. It was a notable change from the theoretical planning office work into a position with the daily concerns of the staff in the normal operation of the whole Air Force. Coincidentally with my arrival to

the position began significant Defence budget reductions and the Air Force, as with others services, came under scrutiny of financial restrictions. Together with financial reductions came political decisions to support NATO operations in Afghanistan with a helicopter unit and to protect the Baltic States airspace within the NATO Integrated Air Defence System (NATINADS). However, protection of Czech Republic airspace within NATINADS became my higher priority. These tasks were adapted to the preparation of military contingencies for various missions in order to provide a functional training system, safe operations and to maintain



© Jan Kouba 2012

sustainable capacity for the Czech Air Force. I believe the greatest achievement of the Czech Air Force is the ability to fully participate in NATO operations.

The security environment has changed from the time of the Cold War. How do you consider the present and future role of the Czech Air Force?

The Air Force expands military operations into the third dimension. In current and future conflicts there will always be air operations as 'Strategic Enablers'. In the joint operations area the Air Force Commander always supports the Joint Force Commander and assists in achieving the objectives of the operation. The absence of Air Forces in military operations would make any military activity unthinkable. The Air Force must be capable of performing a broad spectrum of tactical tasks to include transport, search and rescue, evacuation, air traffic management, supervision of air traffic by Air Policing, reconnaissance and support of

ground forces with the aim to reach air superiority, allowing the Joint Force Commander to accomplish the operation. Our experiences with the Joint Force concept show the synergistic effect of joint efforts. The key is mutual understanding and respect for individual tasks within Air-Land Integration (ALI). Current and future Air Forces have basically unlimited firepower with pinpoint accuracy, freedom from interference and a short reaction time. Without air superiority ground forces may be defeated in advance. On the other hand no aircraft can pass from house to house and tap on the door to secure the area of operation as a soldier can.

Sir, how has the Czech Air Force changed since joining NATO?

In the nineties, the armed forces of the Czech Republic experienced the full effects of the end of the Cold War. From 1990 to 2000 the Air Force dissolved 95 % of its



© Jan Kouba 2012

The JAS-39 Gripen on a Czech Air Force training sortie.

capacity. With our accession to NATO, the situation stabilised. With new opportunities and advanced technology development, we launched a brand new Air Force, practically from scratch. In the process of integration into NATO the most important milestone was the arrival of the fully NATO compatible subsonic aircraft L-159, which opened the NATO door to us. Our pilots immediately started training with the same technology and procedures as our alliance partners. Two years after introducing the L-159 aircraft to the service we were securing the NATO summit in Prague with NATO colleagues. I have to underline the role of the Belgian Air Force in mentoring our training to NATO standards. NATO puts great emphasis on the integration of new members. Our participation in NATO exercise AIR MEET demonstrated huge progress. This culminated in the invitation of an L-159 squadron into the Tactical Leadership Program (TLP) and the training of our pilots to the qualification of Allied air command Mission Commanders. The JAS-39 Gripen multirole fighter came to the scene in 2005. Our pilots were re-trained and, after a brief preparation, entered service in the NATINADS. They were deployed to protect the airspace of the Baltic States in 2009. Today, our L-159 squadron focuses on allied support. We support the ISAF mission with the training of air controllers in cooperation with the Air-Ground Operations School. As the Belgian Air Force previously assisted us in the process of integration into NATO, we now support the

new Allied Air Forces of Lithuania. In addition, our helicopter pilots are training pilots of the newly formed Afghan Air Force in the Czech Republic as well as in Afghanistan. For the last two years our helicopter unit was deployed to Sharan base to provide transportation service for RC-EAST.

Sir, could you assess the current status and perspectives of the development of the Czech Air Forces in the context of the present geopolitical and economic situation?

With the coming of Gripens to the service in 2005 we became the most advanced Air Force in NATO due to the highest number of new generation aircraft in service. The Czech Republic is a medium sized country in the heart of Europe. From the historical context our Air Force has a great tradition and is well perceived by the public. The Czech Republic has 10 million inhabitants with 20,000 members in the Armed Forces, of which 5,000 are in the Air Force. Though we pledged to spend 2% of GDP on defence at the Prague NATO summit, the current economic crisis compels us to reduce defence spending. This year's budget is a mere 1% of GDP, and in this respect we are on the lower rungs of NATO. A White Paper on Defence describes this dismal state and defines our priority tasks, the ability to defend Czech Republic territory and our allied commitment. The White Paper clearly defines our

commitment to further contribute to a common defence with supersonic aircraft, within NATINADS, and play an active role within the Alliance. The JAS-39 Gripen squadron lease contract expires in 2015 and negotiations are underway on the possibility of continuing the protection of airspace, within NATINADS, with supersonic aircraft.

The Czech Air Force is also active in the field of international military cooperation. Would you please highlight some of the bilateral and multi-lateral cooperation of the Czech Air Forces within NATO?

Our commitment to play an active role in NATO is evident in the cooperation with our neighbours. Our JAS-39 Gripens normally operate in German airspace. Conversely the German Eurofighter operates with us in our airspace within NATINADS. A newly signed Czech-Slovak intergovernmental agreement on the joint movement of military aircraft basically reunified Czechoslovak airspace. We also cooperated very closely with the Lithuanian Air Force on a bilateral basis. Next, an important chapter of our international cooperation is cooperation with the 1st British armoured division. In a long series of exercises called FLYING RHINO we trained hundreds of air controllers from almost all member states of NATO and PfP countries. Our contribution to ALI within joint operations on the digitalised battlefield is also considerable. At this year's NATO Summit in Chicago, the Czech Republic and Croatia signed up for an international training centre for helicopter pilot training as a 'Smart Defence' project. Among other things, our rich experience in ISAF with the training of Afghan helicopter pilots is our great contribution to the helicopter training initiative. With the Czech Republic Air Force joining NATO Airborne Early Warning (NAEW) our specialists got directly involved in the operation of allied AWACS E-3 aircraft. With this step we started close cooperation, to include aircrew and Air Force units training of the Czech Republic.

The Czech Air Force has participated in several NATO operations since the Czech Republic joined NATO. How do you evaluate Czech Air Force contribution to these operations?

The beginning of our engagement in foreign operations under the NATO flag dates back to the KFOR operation in the Balkans with helicopters and tactical transport aircraft (AN-26 and L-410). After the Czech Republic joined NATO in 1999, we immediately began continuous engagement of our Air Force in the NATINADS. Through 2005 the support was provided by the historic MIG-21 which moved out of service with the advent of the JAS-39 Gripen. Acquisition of new technology and modernisation of NATO standards has enabled us to fully participate in the wide range of NATO operations. Our pilots became seasoned and grasped NATO specific procedures during the training process. In fact, every unit of the Air Force has an assigned allied priority task. The Transport squadron rotates our contingents into ISAF. The JAS-39 squadron is embedded in NATINADS and rotates in the Baltic mission, and the L-159 squadrons provide FAC training for all allies. Helicopter squadrons are directly involved in ISAF operations and have provided training for aircrew and ground staff of the Afghan Air Force in Kabul for over four years. Our GBAD unit is part of the NRF and our Command and Control Centre manages the NATO backbone radars located in Czech territory.

Many Czech Air Force experts serve within the NATO military structure. How do you see their contribution to NATO and what benefits do they bring back to the Czech Air Force?

Members of the Air Force staff serve in various positions in the whole command structure of NATO. Key positions for the Air Force are within the CAOCs and AC HQ RAMSTEIN. Our staffs are also in different positions within the ISAF command. Traditionally, we send Air staff to the JAPCC and JALLC. The main benefit for us from our contribution is the gathering of experience within NATO, and the international environment, in the area of NATO procedures and standards to be used in further development and integration of the Czech Armed Forces. Involvement in NATO and the international environment allows us to extend international cooperation and increase our contribution to NATO by enhancing our active role. It is a matter of routine to find records of active roles with our senior leaders, in the NATO military structure, which boosts our cooperation and interoperability with our allies.

Sir, what is your prediction for Air Force development in the future? Do you think the Czech Air Force follows evolving trends?

Air Force operations are always based on the use of the most advanced technology. My perspective of Air Force development is directed towards the deep integration of Ground and Air Forces within Joint operations. Mutual understanding between Ground and Air Forces supported by digitalisation of the battlefield is the key for success. Infantrymen always need to be sure they are supported anytime/anywhere by well trained and capable airmen. On the other hand, airmen have to be cognisant that it is impossible to win without boots on the ground. There is only one way to reach the required effect, and that is mutual understanding of each other. A prime example is the joint use of airspace over the battlefield. The pilot has to operate in an environment where Ground Forces use UAVs, artillery, GBAD units and helicopters to support forward elements. It requires unity of command and a secure system of communication to coordinate such complex activities. Today, it is nearly impossible to find an opponent equal to NATO's military power. This highlights the likely distribution of the efforts to the numerous asymmetric operations requiring a very strict legal environment based on information dominance supported by a minimised and surgically precise use of force. It is already commonplace to use only precision-guided munitions, as unguided bombs remain in the 20th century. The standard is extensive documentation of each use of force and the decision-making process. The future of the Czech Air Force is also aimed in this direction. Training is focused on crisis management in airspace caused by military,

civilian and non-state actors. In Air to Ground operations lies the key capability to identify very small spot targets, most likely in urban areas. The use of UAVs will accelerate. Pilots will become remote airborne platform operators in the future.

Sir, what do you consider the greatest achievements and challenges of the Air Force? What are the most important tasks for the Czech Air Force in the next 10 to 15 years?

Unequivocal successes are our active international participation in ISAF, Air and Advisory Team (AAT), Heli Unit Task Force HIPO and Baltic Air Policing. To achieve these successes we employed considerable effort with unflagging patience. I also consider a great success, the achievement of a high safety level of Air Traffic and the professional approach of all Air Force staff to their work. There aren't many setbacks. I would call the annual exclusion in the operation of the entire fleet of L-39 training aircraft caused by a technical problem with the engine a setback. This delay disrupted the continuity of training and, in connection with the economic crisis, will affect the future training of the Air Force. Our priority in the coming years is to continue the operation of supersonic aircraft and development of our skills. This year we have achieved Air-to-Air Refuelling (AAR) capability and will continue to expand our capabilities in night operations. We will not stay behind in the field of digitisation and information dominance. We associate these fields with the improvement of reconnaissance capabilities and usage of precision weapons.

Sir, thank you for your time and your comments. ●



Brigadier General Jiří Verner

is the Czech Air Force Commander and Czech Joint Forces Deputy Commander. He holds a degree from the Military Air Force College in Košice in 1985 and graduated from the Air and Ground Operations School, The Netherlands (1999) Air War Academy, Alabama, USA (2001) and Aero-Technical School in Linköping, Sweden (2005). As a pilot he logged more than 2,100 flight hours in the L-29, L-39, Su-25, MiG-21 and JAS-39 aircraft. In 1999 he was appointed the Chief of Air Force Department, Deputy Air Force and Air Defense Inspector at the General Staff of the Armed Forces. In 2007 he went to the International Staff at NATO Command in Brussels. In March 2009, Jiří Verner was appointed to his present position and promoted to Brigadier General in June.



© U.S. Air Force

The MQ-9 Reaper will need a higher data transfer rate in the future.

Laser Communication

Exciting UAS Emerging Technology

By Dr. Wolfgang Griethe, Tesat-Spacecom GmbH & Co. KG, Backnang, Germany

Introduction

Today, Light Amplification by Stimulated Emission of Radiation (LASER) has found its application in all areas of modern life. Laser light is monochromatic, coherent, and all of its energy is focused to produce a tiny spot of intense power. This focused power predestined laser light for aerospace applications as well. The laser in particular can serve as a key building element for linking High Altitude Long Endurance (HALE)/Medium Altitude Long Endurance (MALE) Unmanned Aerial Systems (UAS) with spacecraft. Hence, subject of the subsequent discussion is laser based satellite communication and existing possibilities for the deployment of high-capacity laser links in UAS scenarios. Starting from the motivation for the introduction of that

emerging technology in the UAS-domain, the current development status will be highlighted, the existing challenges are addressed, and the next implementation steps towards an enhanced Intelligence, Surveillance and Reconnaissance (ISR) capability will be outlined.

Motivation for Laser Links in UAS Applications

Hardly any technology has retained a greater recovery in recent years than that of the UAS. The rationale for this is manifold but the main advantage of an UAS consists primarily in its ability to be used for surveillance or reconnaissance without endangering friendly forces.

However, long-range surveillance and reconnaissance by HALE/MALE UAS requires both, signal detecting sensors and imaging sensors, like optical, infrared, multispectral, hyper spectral, radar and full motion video (FMV). Experiences show that the requirements to the sensors are constantly growing, and an end of this trend is unforeseeable. Considering the advances in sensor technology it is expected that the data traffic will continue to rise. For Predator the average data rate amounts to 3.2 Mbps and 50 Mbps are currently specified for the Global Hawk. In five years, a data volume of 45 Mbps is expected for Predator and more than 270 Mbps for Global Hawk.

“The satellites communicate over distances of more than 5,000 km with data rates of 5.6 Gbps, i.e., equivalent to 200,000 A4-pages per second.”

On the other hand, the number of HALE/MALE UAS is increasing and the vehicle number operating in Europe by 2020 is predicted to be around 200 compared to an estimated 50+ airborne worldwide, 24/7, today. With out-phasing of the TORNADO weapon system, starting from 2025, the resulting capability gap will be most likely filled by further HALE/MALE platforms. Beyond 2025 it is expected that HALE/MALE UAS will have achieved a performance level that enables them to take the tasks of today's manned aircraft.

The only way to operate HALE/MALE UAS and to transmit sensor data from far remote areas into headquarters is via satellite communication, and therefore the Beyond Line of Sight (BLOS) Link is vital. No UAS will become operational without BLOS Link. The BLOS link is a key component for unmanned reconnaissance systems.

The rising number of UAS on one hand and the usage of high performance sensors on the other hand are serious factors for an increased bandwidth demand. The satellite transmission of such data sets for a large number of operated UAS is becoming more and more difficult. To handle the deluge of sensor data, techniques for data storage, triage (selection) and pre-processing are currently used, with impact on the

real-time character of this data. In addition, the procurement of that equipment is costly and means additional weight which in turn adversely affects the endurance of the UAS.

The prevalent lack of satellite capacity in areas of military operations compels the use of commercial providers on a leasing basis. The leased frequencies are mostly regulated for the Fixed-Satellite Service (FSS) but not for mobile aeronautical applications, unfortunately.

The provision of the required frequency bands therefore raises complex regulatory issues that can only be solved at the International Telecommunication Union (ITU) level. A regulation is expected in the future, but it can already be predicted that the demand for bandwidth surpasses the means. This emphasises the importance of laser communication (LaserCom) in four respects:

1. The laser carrier frequency allows bandwidths in virtually unlimited range. Resource shortages are a thing of the past. In addition, these frequencies can be used immediately without lengthy coordination.
2. A big advantage is the fact that laser frequencies cause neither harmful interference nor detectable emissions, and should therefore be preferred for SIGINT applications.
3. Eavesdropping is possible only in the presence of an eavesdropper in the laser beam. From the low earth orbit the laser spot undergoes a flare at the earth surface to about 10 m. From the geostationary orbit the beam diameter is about 800 m. The whereabouts of a putative eavesdropper within these conical surfaces should not go unrecognised.
4. An essential benefit of LaserCom results from the fact that the laser link relieves the C2-radio link (Command & Control) from sensor user data. Currently, control data and vehicle commands together with reconnaissance data are transferred by one and the same BLOS-link, in mostly the Ku or Ka band. In the future, the laser link is maintained for the transmission of broadband sensor data only, whereas the C2-radio link is available exclusively for vehicle command and control.

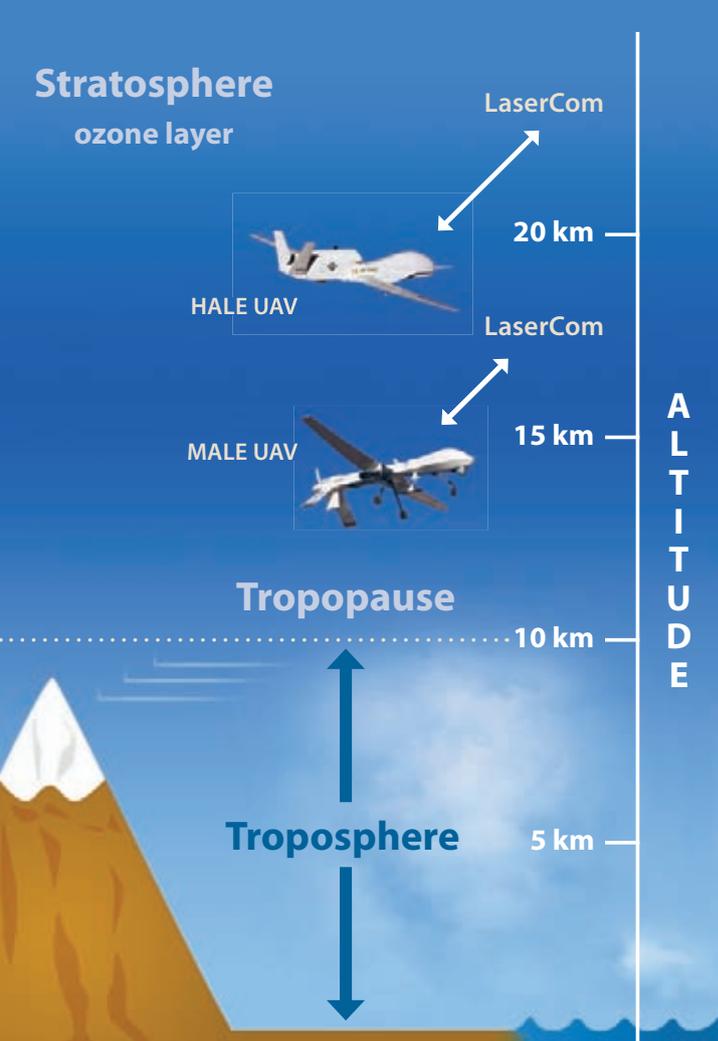


Figure 1: Altitudes of HALE/MALE vehicle.

Consequently, that link can be designed in narrow-band and thus much more resistant to multipath reception, jamming and other interferences.

Current Development Status of Laser Communication

LaserCom as key technology has a high priority in the German National Space Program and is supported by the German Space Agency (DLR). For space applications a standard is meanwhile established by Tesat-Spacecom's LaserCom Terminal (LCT). Since 2007, the LCT has operated in space aboard the US satellite NFIRE and on the German TerraSAR-X. The satellites communicate over distances of more than 5,000 km with data rates of 5.6 Gbps, i.e., equivalent to 200,000 A4-pages per second. As part of the LCT-verification program inter-satellite links, and even ground links, were tested. The performance characteristics and robustness of the inter-satellite links have been sufficiently verified. Furthermore, valuable insights were gained regarding the behaviour of laser links during their passage through the atmosphere.

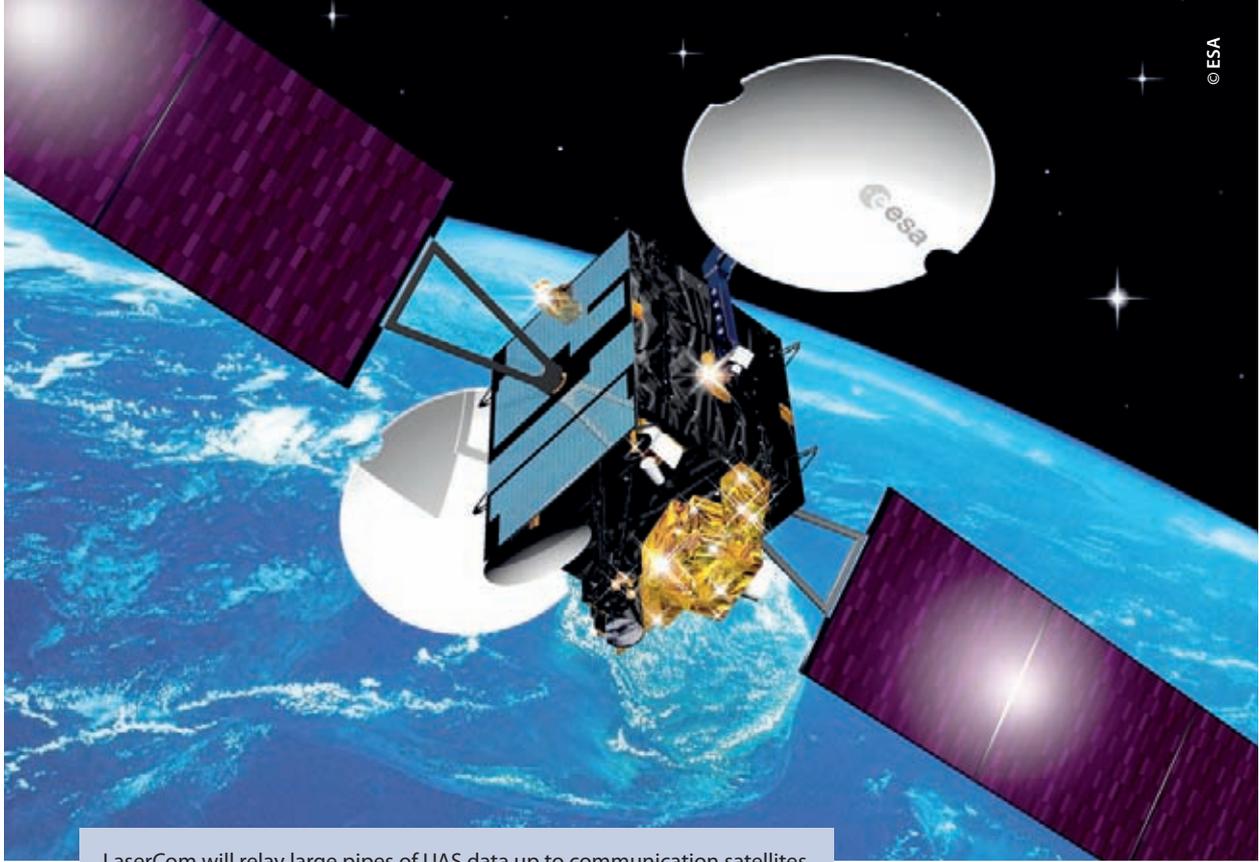
Challenges for the Deployment of Air-to-Space Laser Links

Despite of all of the above-mentioned advantages, LaserCom must be seen realistically since every new technology has its advantages and disadvantages. A serious disadvantage is the susceptibility of the laser link on its way through the atmosphere. Irrespective of the fact that wave-front and phase distortions of a modulated laser carrier can be compensated by adaptive techniques, molecular scattering and absorption in the troposphere cannot be prevented and may even mean link interruption. However, above the Tropopause the influence of the beam quality is virtually meaningless. For this reason it is highly recommended LaserCom be used for UAS at altitudes above the weather, i.e., HALE/MALE vehicles (Figure 1).

Moreover, it has to be recognised that some other challenges have to be overcome before the operationally reliable use of air-to-space links. LaserCom will have an impact on the UAS concept of operations (CONOPS) but will also significantly affect the Ground Control Segment (GCS) of the platform due to the LCT on the UAS needing to be operated by a pilot on the ground. Another challenge is that the point-to-point connection from the UAS to the satellite has to be established very precisely. For the return uplink to a geostationary satellite that issue is less problematic as the satellite is seen in a constant position from earth, but the deployment of the forward downlink is more complicated as the UAS has to be tracked permanently by the spacecraft.

Exploitation of Laser Links – The Road Ahead

The LCT verification program will be completed in early 2013 and afterwards, in cooperation with a UAS manufacturer, a demonstration of an airborne LCT is envisioned to be tested aboard an UAS under flight conditions. At that time the spacecraft Alphasat will have taken its place in geostationary orbit (GEO) and, consequently, a first GEO-LCT test bed will exist. In the subsequent period the European Data Relay System (EDRS) will also be deployed offering an appropriate broadband service for UAS applications.



Summary

Today, LaserCom is not science fiction, but reality, and a prototype of an airborne LCT compatible to the space borne LCT will be available in the foreseeable future. The importance of LaserCom results from the rapidly increasing demand for bandwidth. A change from the Ku band to the Ka band can be, at best, an interim solution limited in time. Of course, the propagation of lasers through the atmosphere is always afflicted by degradations. For that reason the deployment of tactical data links by LaserCom is explicitly recommended either in space or above the weather layer. Only in such an environment will the advantages of LaserCom come into its own. LaserCom

offers unprecedented bandwidths, allows the use of coordination-free frequencies, rates high in defence against interception and does not generate electromagnetic emissions. LaserCom enables the capability to integrate air and space-based wide-band ISR systems into national military command and control systems in a way that was previously not possible. This technology allows network topologies which are geared to the needs of the armed forces of tomorrow. In other words, a global connectivity of sensors, decision makers and shooters is prospectively possible only by use of newest communication technologies, like LaserCom, in order to enable synchronous actions at all levels in terms of Network Centric Warfare. ●



Dr.-Ing. Wolfgang Griethe

studied Electrical Engineering at the Technical University in Dresden, Germany from 1968–1972, specialising in Process Control. In 1982 he received his PhD in Engineering. His career in the space industry started in 1988 at Kayser-Threde GmbH, a Munich based enterprise. He had duties in leadership positions as Department Head, Section Head and Vice President, Space Utilization. In 2009 he joined Tesat-Spacecom GmbH & Co. KG as Head of Strategy. In this position he manages Tesat's LaserCom program for UAS applications. Dr. Griethe is a member of the German Association for Defence Technology (DWT) and head of the Munich section.



NATO E-3A AWACS is aiming for the future.

Expanding the Role of NATO AWACS

Reducing the Mission Execution Chain

By Major Andrew 'Nile' West, USA AF, NAEW&C Force Command

Introduction

Over the last several years HQ NATO Airborne Early Warning & Control Force Command (NAEW&C FC) has experimented with new mission tasks and capabilities for NATO AWACS. The NAEW Force and the NATO Communication and Information Agency (NCIA) have worked on test and experimentation events to expand the future capabilities of the platform while meeting the needs of the warfighter. The insights gained at Empire Challenge 10, Bold Quest 11 and Arctic NATO Tiger Meet 12, along with future test analysis at Bold Quest 13 will lay the ground work in defining future capabilities for NATO AWACS.

Requirement for NATO AWACS to Enable Tactical Control

During Operation Unified Protector (OUP), without boots on the ground, it was difficult to have situational awareness on civilian and friendly forces. A Joint Terminal Air Controller (JTAC) is normally embedded with ground forces to provide direct communication for air support to enable Joint Fires, however JTACs were not used in this conflict; Libya was a politically denied territory for ground forces. The Joint Force Air Component Commander had airborne Intelligence, Surveillance and Reconnaissance (ISR) assets in the battle space, however the complaint was there were

not enough to support the mission. Commanders always want more 'eyes' on the conflict. Planners, therefore must maximise the effectiveness of these limited airborne sensors.

Most sensors are used in a linear fashion. The ISR data is shared with a single end user or a hub. Data is then shared with others, in what is often a late process due to intelligence processing which does not always support the warfighter with a timely decision making tool. Cross-cueing of these sensors would improve the quality and timeliness of the data these sensors generate. The concept of a Network Enabled Capability (NEC) is not new. Multiple airborne sensors combined in a NEC would allow for near real time cross-cueing and provide Airborne Battle Managers and Terminal Controllers, co-located on a Command and Control (C2) platform, to decrease response time and deliver weapons on target. Such an augmented AWACS crew with multiple networked sensors could accomplish an entire Close Air Support (CAS) mission internally on the NATO AWACS. With all the networked information the skilled crew members would be able to complete aircraft check-in, refuelling, weapons release, battle damage assessment (BDA), and return to base (RTB). There are two advantages of using these tactics. First, a C2ISR platform like AWACS would be in digital communications with the all ground forces and aircraft. Second, multiple sensors collecting data in the area of operations linked to AWACS would increase the situational awareness of the augmented crew and improve the decision making process. With enough bandwidth, the communication capability of the NATO AWACS could also facilitate this link.

The NATO AWACS has been operating and testing an Internet Protocol (IP) communications rack on board the aircraft. The IP communications rack is a multi-medium network hub for new IP applications. IP communications has increased the NATO AWACS's effectiveness and expanded mission tasks. Chat tools have been used for over a year in Afghanistan with the International Security Assistance Force (ISAF) in addition to OUP. NAEW Force has been testing other IP communication tools such as NATO Friendly Force Information (NFFI) and Coalition Shared Data (CSD) server. The CSD allows the NATO AWACS to connect to ISR



networks and share non real-time products. As with all links, as more information travels through it, the more bandwidth is required. Currently AWACS has a very limited bandwidth which restricts the amount of information available to crews. To enable networked sensors and other IP applications this bandwidth must be increased.

Bold Quest 2011

Last year the NATO AWACS participated in Bold Quest 2011. The NAEW Force experimented with new technologies to allow the JTAC to communicate digitally with CAS assets. In addition, the NAEW Force augmented the AWACS crew with JTAC personnel. This decreased the observe, orient, decide, and act (OODA) loop which, in turn, increased timely support to the warfighter. The crew used IP Chat and NATO Integrated Command and Control (ICC) system to provide digital communication and data to the JTAC. The Full Motion Video (FMV) from a disassociated sensor linked to the NATO AWACS provided the JTAC with near-real time visual target information. With digital communication tools, ISR data, and FMV the JTAC was able to provide direct support for two scenarios.

In the first scenario, a High Value Target (HVT) individual drove a truck through the area of operations. The augmented crew 'watched' the HVT as it progressed through the scenario. The JTAC through IP enabled digital feeds, updated ground forces with



location, heading, speed, possible weapons, and recommended an intercept point. When the HVT stopped near the intercept point, friendly ground forces closed in and surrounded the individual. The HVT was taken into custody and removed from the location within 2 minutes. The JTAC on the NATO AWACS coordinated the intercept without needing to make a radio call.

In the second scenario, troops-in-contact required air support. The JTAC on board the NATO AWACS provided the nine-line brief to an A-10. The JTAC initiated the target talk-on when the A-10 had to RTB due to low fuel. All JTAC requirements, however, were met and the mission was progressing towards weapons employment.

The IP Communications rack offered other capabilities as well. The rack is multi-path capable, meaning IP data can be transmitted on Iridium, HF, and UHF. The communications rack uses bandwidth management equipment (BME) that could allow different applications on different mediums. The multi-path capability proved invaluable when the Iridium satellite signal was lost. When this happens the Deployable Ground Entry Point (DGEP) switched to the HF radio with no loss of network service. In a low bandwidth environment, the BME will help the platform maintain its connection.

Arctic NATO Tiger Meet 12

This year the NATO AWACS participated in the Arctic NATO Tiger Meet in May and June. HQ NAEW Force and NCIA added two more applications to the IP communication rack, Kongsberg Exploitation System (KES) ISR station and Forward Air Controller Navigation System (FACNAV).

The KES allowed the NATO AWACS crew to view ISR images from the ground network. Previously, NAEW Force and NCIA have discussed using a Joint ISR coordinator on the NATO AWACS. This exercise was the first step towards determining the feasibility of this concept. It was discovered that the ISR tools could have many uses, to include supporting the JTAC.

The FACNAV kit provided the JTAC on the NATO AWACS augmented crew to have access to most of the digital tools that are available to him on the ground, including variable message format (VMF). VMF is the NATO standard for CAS assets to communicate digitally. The JTAC on board the NATO AWACS successfully used Dutch and Norwegian F-16s to engage and drop bombs on simulated targets attacking a convoy. He coordinated attack headings, collateral damage estimates, friendly force location, and command element approval to engage. This is the first

time Terminal Control has been executed from NATO AWACS! This successful 'proof-of-concept' demonstrates increased mission capability of NATO AWACS.

Bold Quest 13

Next year NAEW Force plans to build on lessons identified at Arctic Tiger and apply them to Bold Quest with the additional aim of linking FMV from a targeting pod. A SNIPER pod carried by a NATO aircraft provides FMV and meta data through a direct data link to the NATO AWACS. The desire is to link the NATO AWACS with multiple sensors, employ FACNAV and SNIPER FMV to provide timely CAS support to the warfighter.

While not directly related to CAS, all combat identification is critical to the NATO AWACS mission. Bold Quest 13 is also the United States Department of Defense Joint Operational Test Approach (JOTA) for the upcoming Mode 5. While the NATO AWACS acquisition of a Mode 5 interrogator is currently in the planning stage, this is an excellent opportunity for the NATO AWACS crew to test the Joint NATO Concept of Employment for Mode 5. Bold Quest 13 will be the marquee event for NAEW in combat identification for both ground and air targets.

Future of NATO AWACS

Aircrew are very proficient in their current missions and roles. However, as warfare advances the platforms employed in support of NATO operations needs to advance as well. A digitally connected and augmented NATO AWACS can provide the Joint Force Commander (JFC) with capabilities and support, until now, was



Will a JTAC augment the AWACS crew in the future?

unrecognised by mission planners. Therefore it is critical the NAEW Force expand the capabilities and mission tasks to meet the JFC's requirements. These tests and new mission tasks have started an evolution of the NATO AWACS. The aircraft is no longer just an early warning and control platform providing radar and radios, but is evolving into an Airborne Joint C2ISR Battle Management Platform capable of supporting many mission types at the appropriate tactical and operational levels.

Conclusion

While the NAEW Force and NCIA have a great track record, more needs to be done. Bandwidth is a limitation in using IP based tools. Without increasing bandwidth the NATO AWACS crew is handcuffed in accomplishing the mission. As the technology on the battle field improves, the NATO AWACS must improve in parallel. IP based links and networks will increase the number of mission tasks the NATO AWACS can support to meet the JFC's operational needs. The ground work has been laid and NATO AWACS stands on the leading edge of technology to continue contributing as a force multiplier into the future. ●



Major Andrew 'Nile' West

is the Branch Chief, Requirements Modernization, for NAEW&C Force Command. He is responsible for NATO AWACS future experimentation events and is the programme lead for future Mode 5 and Enhanced Mode S. Major West has a Bachelor of Science degree in Computer Science from Eastern Michigan University and a Master of Science in Engineering Management from Eastern Michigan University as well. He is a Senior Air Battle Manager on the E-3B/C with more than 2,000 flight hours in the United States and Middle East.



Enhancing NATO's Operational Helicopter Capabilities

The Need for International Standardisation

By Lieutenant Colonel Wido Gerdson, NLD AF, JAPCC

"In-Theatre Airlift availability is a problem in ISAF where NATO operations are constrained by a lack of helicopter lift."

2009 NATO Bi-Strategic Commands Priority Short-fall Areas

Introduction

The recent campaigns in Iraq and Afghanistan have highlighted the unique capabilities helicopters have brought to the asymmetric or Counter Insurgency environment. However, while playing a decisive part in successful operations, it has become increasingly clear to commanders that shortfalls within the international helicopter community are constraining overall mission effectiveness.

These shortfalls can mainly be attributed to two principal issues: some nations are unable to deliver (enough) platforms; and a lack in standardisation and integration between in-theatre helicopters and crews participating in joint and combined operations. The absence of in-theatre standardisation is symptomatic of the wider lack of international standardisation across NATO's Rotary Wing community leading to inefficient use of this resource in joint and combined missions.

With Member State Defence budget cuts affecting the availability of helicopters, embracing NATO's 'Smart Defence' initiative will be a vital part of combating this lack of availability. Thus, 'Pooling & Sharing' of assets will be an important method of resourcing

future military operations in a multi-national co-operation and will be a key in enhancing NATO's operational helicopter capability.

Coalition Standardisation Challenges

Military operations are typically conducted by nations who comprise a coalition of the willing and able. Coalition operations present a number of challenges in key areas such as Command & Control, Rules of Engagement, interoperability, communication, etc., and thus tend to increase the complexity of military operations. Working within a coalition requires more cooperation among all military areas. The past two decades have witnessed a rise in the number and complexity of expeditionary operations, the majority of which placed significant demands upon the multinational helicopter community. Evidence from these operations suggests that it takes several months, perhaps years, in a theatre of operations before the various contributing nations reach a sufficient level of common understanding and confidence to conduct complex combined and joint missions. There are some obvious complications in international standardisation like language problems, briefing standards, common doctrine, understanding each other's operational capabilities, etc. Some reasons for these deficiencies are the various interpretations of accepted common Standing Operating Procedures (SOP) and Tactics, Techniques and Procedures (TTP's) a lack of combined training opportunities, the absence of a validated NATO evaluation system and limited knowledge of

each other's capabilities/standards. In order to shorten the time required to conjoin forces and to increase the effectiveness of joint operations, NATO's helicopter capability framework (whether DOTMLPFI¹ or otherwise) has to be further developed and invested in.

Common understanding between NATO and the EU is slowly improving but there still isn't a common accepted standard for helicopters. With an overlap of 21 member states that are in NATO as well in the EU, it is essential that both the EU and NATO cooperate in the development of their helicopter concepts and procedures.

Important Initiatives

NATO's Helicopter Inter-Service Working Group (HISWG) is the central forum for developing doctrine and TTP's within ATP-49². The HISWG also coordinates other helicopter related NATO documents. Other important initiatives, outside of the USA, to improve international helicopter training events are with the European Defence Agency (EDA) and their Helicopter Training



More multi-national training is crucial to enhance future combined missions.

Programme, which aims to provide users with training opportunities through a series of live fire and flying exercises, simulator training and tactics symposiums. International exercises such as AZOR 2010 and Italian Call 2011 are examples of their ability to plan large scale international exercises. With this track record, the EDA is has shown to be the most effective international helicopter agency in Europe. The 7-nation³ European Air Group (EAG) organises an annual Joint Personnel Recovery (JPR) Standardisation Course with the aim to improve capability through interoperability within the EAG member nations. In this course they combine several of the EAG nations' helicopters in a 3 week course on JPR including specialised ground troops, fighter escorts and AWACS.

Possible Solutions

NATO/EU Cooperation. It is astonishing that, with 21 nations contributing to both NATO and the European Union, there is a lack of a common accepted standardisation across the NATO/EU helicopter community. It is essential that both NATO and the EU cooperate in the development of their helicopter concepts, procedures and use of assets.

NATO Helicopter Coordination Cell (NHCC). A practical coordination level for NATO helicopters does not exist. There is a need for a different approach to coordinate international standardisation. NATO and the Nations must realise that new methodologies to establish international standards are required. It can no longer be the exclusive responsibility of individual nations to manage the creation, implementation and evaluation of international helicopter standards. NATO, in close cooperation with the EU, must conduct a study to determine the viability, location and scope of an organisation like this. This helicopter coordination cell must be able to take the doctrine and TTP's produced by the NSA and ensure this doctrine and TTP's are commonly understood and employed by allied nations. NATO is currently not equipped to coordinate evaluations, exercises, international training programmes, etc., for helicopters. Within ACO, AC Ramstein is in charge of conducting FW standardisation/evaluation, but is not responsible for doing the same for Air Force helicopters. Army Aviation has no NATO

organisation that coordinates international standardisation/evaluation either. To establish an effective common international standard, an overarching Joint NATO Air Force and Army coordination cell must be established that oversees the implementation and employment of international standards. Navy helicopters should also be included in this NHCC. A NHCC could also be used to collect helicopter Lessons Identified (icw the JALLC) and deliver timely solutions, as Lessons Learned, back to the user community. Unfortunately since NATO reorganisation will be completed in 2012 any personnel and resources for the creation of a NHCC will have to come from existing NATO or national organisations.

Evaluation/TACEVAL. The absence of a validated evaluation system similar to the Fixed Wing (FW) community is a major complication affecting the NATO/EU Rotary Wing community. NATO/EU should implement the TACEVAL system that will check the basic standards of language, briefing formats, crew briefings, basic flight manoeuvres, debriefing formats, etc. Much can be learned from the FW community (e.g. a common evaluation system).

NATO lacks helicopter organisational capabilities. NATO should play a key role, along with EDA, in organising advanced multi-national training and exercises; taking best practices from the respective nations. NATO does not, however, have an existing organisational institution to cover overall helicopter issues. The requirement for more advanced co-operative training and exercises will become increasingly apparent with anticipated budget cuts in defence spending and fewer training opportunities.

A common data base for Education and Training. Most nations are not aware of each other's exercises and training capabilities, which cause missed opportunities for enhancing international cooperation. To improve this, information on high quality nationally organised exercises and training opportunities should be centrally located and available to coalition partners. NATO and EDA should have a common data base to facilitate opportunities for value-added international exercises and training. Nations should be able to contact each other easily. Increased availability

of helicopters for training of ground troops must be part of the improvement campaign. Nations will be more willing to conduct international standardisation Education & Training (E&T) when there is a central registration highlighting specific national E&T capabilities to plan from.

Mission simulators. With ever increasing restrictions placed on live training, the Synthetic Training Environment (STE) is being increasingly utilised for flying training, mission training and mission rehearsal. The principles of standardisation and interoperability apply equally to the synthetic environment, hence the requirement to use compatible technologies and implement existing protocols. Standard simulators could be used for multi-aircraft mission simulation; the GBR simulator complex in RAF Benson is a good example of this. They conduct so called 'Thursday Wars' running complex joint helicopter scenarios with up to 6 EH-101 and CH-47 helicopter simulators which can also be connected to Apache simulators. The USA has the Aviation Combined Arms Tactical Trainer (AVCATT) system, a long time proven concept of a modular system with 6 reconfigurable cockpits of AH-64, CH-47, OH-58D and UH-60 helicopters to conduct effective combined arms mission simulation. For most nations, funds for mission simulation are not momentary feasible due to budget cuts in the coming years, so innovative industry initiatives are required. The EDA is very active in providing STE training and reflects a promising initiative.

Tactical Leadership Programme (TLP). A potential solution to enhance helicopter standardisation and interoperability could include a Tactical Leadership Programme (TLP), similar to the FW TLP. Most NATO nations show an interest in a TLP for helicopters. First, TLP initiatives were already made by the EDA⁴. NATO should follow this initiative, and combine its efforts with the EDA. Valued nations such as the USA and Turkey should not be left out. The set-up for a MOU organisation must be investigated. This would be similar to the FW community TLP in Albacete, which could, ideally, be combined with a NHCC.

Pilot Exchange Programme (PEP). An expanded PEP is a key to enhancing national knowledge on tactics and procedures and to establishing an international

network. This is precisely why many traditional NATO helicopter powers place such a high value on their PEPs. Nations with no PEPs are encouraged to develop a programme so they can exploit the benefits of these programmes as well. Nations that already have very robust PEPs should look for opportunities to expand PEP's with additional nations; preferably it would be a two-way exchange but a one-way would still have value.

Annual International meeting for Weapon Instructors (WI)⁵. Exchange of lessons learned between nations is very poor. There are initiatives such as the NLD/GBR/USA Apache WI meetings; however, there is no collective WI meeting. One way to improve this is to assemble all nations' WI's to exchange ideas annually.

JAPCC Helicopter Study

Following the publication of the JPR Primer, the JAPCC conducted a study on 'Enhancing NATO's Operational Helicopter Capabilities' published in the summer of 2012⁶. Army and Air Force organisations are used for the study. The intent is to include Navy helicopter organisations in the future. The Study finds that shortfalls in standardisation, operational capability and required E&T, including training structures, are not fully appreciated by a significant majority of NATO and EU member states. The Study also provides advice to military commanders and staffs, on how to improve standards required for multinational co-operation and provide innovative ways to address future training requirements. It is designed to provide the reader with thoughts on approaches to enhance the helicopter availability in land operations for NATO.

Conclusion

Due to the complexity of how Air Force and Army Aviation units are organised in NATO it is not clear what organisation should be assigned the task of implementing solutions. It was also clear that many nations do not yet apprehend the challenges that exist in future multi-national helicopter standardisation. The aims of 'Smart Defence' do not release nations from their responsibility to provide the necessary capability to support the NATO mission but provides



© Austrian Air Force

Large international exercise, 'Italian Call', organised by the EDA in conjunction with Italy at Viterbo Air Base is a good initiative but more international exercises should be arranged by NATO.

tools for nations to work together to accomplish the mission. The JAPCC reasons that the improvements intended to enhance international helicopter standards detailed in this study will be hard to realise but an attempt must be made despite the complexity of the problems. In order to enhance NATO's Operational Helicopter Capability, it is important that nations and NATO staffs first concur that the deficiencies listed in this study are valid, and then take ownership of these initiatives and assign responsible organisations to implement them. Also duplications with the EDA initiatives should be avoided. The JAPCC is planning to coordinate an initial NATO Helicopter Conference (to be held in late 2012 or early 2013) on future international cooperation and will invite NATO nations' helicopter decision makers and the staffs of SHAPE, the JFC's, ACO and ACT. This conference must set the foundations for follow-on projects like Joint International Helicopter Standardisation, a NATO Helicopter



Coordination Cell, a TLP, a Joint International Evaluation System, Joint Mission Simulation, a Helicopter Weapon Instructors meet, Joint NATO/EU Exercise and Training Programmes, and Pilot Exchange Programmes. There is also a need for Nations to commit to increased multi-national co-operation and international standardisation and training. Also their willingness to contribute personnel and resources to a NHCC should be explored. Although it may seem impossible to realise these initiatives in this age of austerity, these initiatives will better utilise the scarce resources NATO has while enhancing international standards and thus ensuring the success of future NATO operations. ●

1. DOTMLPFI – Doctrine, Organization, Training, Materiel, Leadership, Personnel, Facilities and Interoperability.
2. Use of Helicopters in Land Operations – Doctrine.
3. Belgium, France, Germany, Italy, the Netherlands, Spain, the United Kingdom.
4. EDA is investigating implementation of a TLP resembling capability in Europe.
5. WIs are considered tactics and weapon deliveries specialists. In some nations they are additionally trained crew.
6. Also available on the JAPCC website: www.japcc.org



Lieutenant Colonel Wido Gerdson

is a seasoned helicopter pilot since 1983 with over 4,700 flight hours in the Bo-105CB, AH-64A/D Apache and ICH-47D Chinook. He commanded operational helicopter units in both Iraq and Afghanistan. Lt Col Gerdson was commander of the Netherlands 298 'Grizzly' Squadron with ICH-47D's and was Chief of Staff of the Tactical Helicopter Group. His staff tours include the NLD Logistic Command for the Apache programme and Chief Attack Helicopter Branch in the NLD AF Staff. He is currently a subject matter expert on helicopters in the Combat Support Branch of the JAPCC.



A Royal Thai Marine simulates a victim during a chemical, biological, radiological and nuclear exercise.

Is There a New CBRN Threat for NATO?

By Major Krzysztof Rojek, POL AF, JAPCC

“All things are poison, and nothing is without poison; only the dose permits something not to be poisonous.”

Paracelsus (1493–1541), Swiss Renaissance physician, botanist, alchemist, astrologer, and general occultist

The Chemical, Biological, Radiological and Nuclear (CBRN) threat faced by NATO has traditionally been seen as “a doctrine of military strategy and national security policy in which a full-scale use of high-yield

weapons of mass destruction by two opposing sides would effectively result in the complete, utter and irrevocable annihilation of both the attacker and the defender”¹. Until the end of the Cold War, the world lived with the threat of nuclear war between the ‘Warsaw Pact’ and Western Alliance Nations. Now however, NATO is facing a shift in the CBRN threat with and a multitude of complex challenges and potential threats to security that are significantly different from those originally faced, or indeed envisaged, when the Alliance was formed in 1949.



© U.S. Marines/Cpl. Jonathan G. Wright

Today, NATO is facing numerous asymmetric challenges that have generated new threats in the CBRN domain. Although the fear of use of CBRN weapons by the world's major military powers has significantly diminished, this threat has now been replaced by a threat from 'rogue states', terrorist groups as well as an increased risk of industrial or civil disasters; the challenge both today and for the future will be to protect and defend against threats from *both* state and non-state actors.

Having considered the changing geo-political situation over the past half-century and recent operations in Iraq, Afghanistan and Libya, we can assume that there remains a risk that Weapons of Mass Destruction (WMD)² will at some point be used against NATO forces. Although the probability of this happening is currently low, the effect of such an event is such that planning for defence, protection and recovery from such a use of WMD must remain at the forefront of NATO contingency planning.

So What Are We Facing?

The most likely scenarios with respect to the use of WMD can be grouped into the following three categories:

1. The 'classical' use of CBRN weapons by nations with the technical means and the political desire.
2. The unconventional use of WMD (or Weapons of Mass Effect (WME)³) by so called 'rogue states' terrorist organisations or other non-state actors.
3. The impact of accidental or intentional release of Toxic Industrial Materials (TIM) as a result of industrial plant failure, hazardous material transportation, as a result of a natural disaster or as a consequence of a terrorist attack, also known as Release Other Than Attack (ROTA).

Category 1 – Classical Use

Previously, WMD were available only to those states that applied the doctrine of mutual deterrence and the perceived balance of terror surrounding the consequences of their use ensured the relative stability of the then bi-polar world order. The threat of 'classical use' of WMD is currently rated as relatively low but, there is the growing spectre of nuclear proliferation. The world's nuclear potential is enormous with the spread of technology; nations previously thought to be incapable of attaining a capability now have the potential to produce weapons with little accountability under the terms of The Non-Proliferation Treaty (NPT) of Nuclear Weapons.

Today there are officially seven nations (not including Israel, which does not represent and does not deny) that hold nuclear arsenals; when considering North Korea and Iran, there will soon be ten. It is also worth noting that almost sixty states already have, or are in the process of building, nuclear facilities for industrial purposes or scientific research, of which forty have the infrastructure that would allow them to produce nuclear weapons in a relatively short period of time.

Also note that the proliferation of WMD includes chemical and biological weapons but most countries are committed by convention and, thus, whilst it is

important to assess the risk of their use, most experts in the field rate the use of chemical or biological WMD by states, as currently highly unlikely.

Category 2 – Unconventional Use

A more likely and indeed serious scenario associated with the proliferation of CBRN weapons can be expected if a 'rogue state', a terrorist group or other non-state actor gains access to such a weapon. There is real danger associated with the use, attempted use or threat of use by one of these groupings of a WMD and it is likely that this particular threat will dominate the thinking of the NATO CBRN Defence Community for the foreseeable future.

For the leaders of a rogue state or terrorist group the actual power or psychological effect achievable through the possession or perceived possession and possible use of a CBRN weapon, make obtaining such a weapon an extremely attractive proposition. The difficulty of obtaining or manufacturing a WMD should not be underestimated but ultimately all that is required is access to the correct combination of knowledge and an appropriately equipped manufacturing facility. These in turn can both be acquired if sufficient funding exists as in the case of the Sarin gas attack of 20 March 1995 on the Tokyo Subway perpetrated by the Aum Shinrikyo sect that killed thirteen and injured over one thousand.

It could be argued that if terrorists possessed a WMD and the means to deliver it, they would surely use such a weapon. However, the likely retaliation on the perpetrators, their supporters and any sponsors for such an attack are likely to be such that they act as a viable deterrent. The more worrying threat comes from those with no discernable links and no 'base' to be retaliated against. Here however the dichotomy exists that financial backing and technical infrastructure is required to create a weapon and as a result, the actual threat one could argue becomes on the use by 'unconventional' actors (rogue states, terrorists and other non-state actors) of a 'traditional' state manufactured CBRN weapon that has been stolen from or 'lost' by a state. The fact remains that there are actors at large that operate in areas where NATO could

conceivably deploy that have the desire to acquire CBRN weapons. Therefore, individual nations and the Alliance as a whole should ensure plans and preparedness are maintained to meet such an eventuality, possibly at short notice.

A further dimension to the CBRN threat in this era of globalisation with the spread of information technology and an all-pervasive media is the concept that the threat of use of WMD is in itself a WME. Just the suggestion of the threat of use of CBRN materials would be sufficient to cause panic and disrupt the normal functioning of society. A good example of the use of a CBRN weapon as a WME, are the Anthrax attacks which took place in the United States over several weeks starting on 18 September 2001. These attacks resulted in twenty-two people being infected and five deaths and an estimated cost for decontamination in excess of \$1B. These attacks continue to attract significant public and media attention even today and it is only the fact that they occurred a week after the attacks of 11 September 2001, that they are not more widely known about outside of the Continental United States.

Any 'substance' sent to a media outlet or government institution following a legitimate chemical or bio-terrorism threat will likely create mass panic with resultant chaos, regardless of what the 'substance' actually is. With the tempo of today's media and social networking the ability to use a simple threat of the use of a CBRN weapon is potentially a terrorist's best tool.

Category 3 – The Threat from the Release of Toxic Industrial Material

This category of threat is the broadest and most likely to occur. There is a huge diversity as well as huge quantities of TIM in circulation throughout the world today; the quantity of chemical and biological material being transported daily on our roads and railways is huge. Whilst transport of radiological material is relatively small, the consequences of a release are potentially more serious as in the case of the incidents at the nuclear power plants of Chernobyl on 26 April 1986 and more recently at Fukushima on 11 March 2011, both of

which resulted in the contamination of vast swathes of the globe (radionuclides from Chernobyl in the Ukraine were detected in Japan and the United States).

The release of TIM can occur through accidents, natural disasters and as direct or indirect result of conflict, to include terrorist attack. Irrespective of the cause of release, these events have to be planned for and a capability to deal with the aftermath created, maintained and continuously developed at a pace at least equal to the development of the threat.

Defence Against CBRN Weapons

Given the risks, the nations of the Alliance and NATO as a body itself should take the necessary steps to prepare the appropriate plans, forces and supporting resources to meet the threat briefly outlined above. These issues were discussed at the NATO summit, and are included in the 'Chicago Summit Declaration'⁴. In addition, they are reflected in the Strategic Concept: 'NATO's Comprehensive Chemical, Biological, Radiological and Nuclear Defence Concept'⁵. According to the later document, projects related to defence against WMD will fall under three pillars:

1. Prevention (Prevent), which includes all action to prevent the acquisition of WMD by potential users, as well as building appropriate defence capabilities in the field.
2. Protection (Protect), which includes ventures to deter use, reduction or termination of the ability to use.
3. Recovery of capacity (Recovery) is associated with all projects aimed at restoring the defence capability if and when it is used.

“Any ‘substance’ sent to a media outlet or government institution following a legitimate chemical or bio-terrorism threat will likely create mass panic with resultant chaos, regardless of what the ‘substance’ actually is.”

Arms control treaties and agreements on non-proliferation of WMD and their means of delivery is one thing, but the real challenge is to stop those entities that do not subscribe to or are not signatories to such treaties from acquiring the ability to use or seriously



© U.S. Air Force, Staff Sgt Stacy Fowler

Airmen test an 'unknown' powder during training at Joint Base Balad, Iraq.

threaten the use of CBRN weapons. Better sharing of information gained through intelligence work by both military and law enforcement agencies will be vital.

“The difficulty of obtaining or manufacturing a WMD should not be underestimated but ultimately all that is required is access to the correct combination of knowledge and an appropriately equipped manufacturing facility.”

NATO's current passive approach to CBRN defence has to shift to more robust active defence making best use of the concept of a Comprehensive Approach (CA) involving civilian agencies, particularly as it is likely to be civil society that will bear the brunt of any attack. Developing CBRN defence capabilities and being able to deploy them rapidly both in the traditional military sense but also in response to terrorist attacks, accidents and natural disasters will be essential. Possessing a viable defence capability is an essential component to deterrence and if deterrence fails, being able to rapidly recover and manage the contaminated environment will further deter an opponent from using CBRN weapons.

Conclusion

The strategic environment has changed significantly in recent years. In particular, WMD threats to the Alliance have evolved to include those from non-State

actors. In this challenging security environment, NATO must be prepared to ensure the Alliance (its populations, territory and forces) remains secure from all CBRN threats. The use of CBRN weapons by an adversary would reduce the effectiveness of friendly forces and could create serious political, psychological and even economic consequences. All of this indicates that the most likely, and spectacular, use of CBRN weapons would be against a predominantly civilian target whose ability to protect itself against such an event would be limited. This, in turn, drives the need for proper contingency planning and the need for a CA. How to defend against CBRN threats is but one of the strategic challenges being faced by NATO but the message of this article is simple. Given the risks posed by CBRN material in the hands of states or individuals and the release of TIM as a result of accident, natural disaster or terrorist activity, NATO has little choice but to continue to focus on this challenge despite the current 'age of austerity'. ●

1. Col. Alan J. Pauvington, USAF Mutually Assured Destruction Revisited, *Strategic Doctrine in Question, Airpower Journal*, Winter 1997.
2. The first use of the term 'weapon of mass destruction' on record is by Cosmo Gordon Lang, Archbishop of Canterbury, in 1937 in reference to the aerial bombardment of Guernica, Spain: "Who can think at this present time without a sickening of the heart of the appalling slaughter, the suffering, the manifold misery brought by war to Spain and to China? Who can think without horror of what another widespread war would mean, waged as it would be with all the new weapons of mass destruction?" A weapon that is capable of a high order of destruction and of being used in such a manner as to destroy people, infrastructure or other resources on a large scale.
3. The Homeland Security Advisory Council defines WMEs as 'weapons capable of inflicting grave destruction, psychological and/or economic damage'.
4. Chicago Summit Declaration, May 2012.
5. NATO's Comprehensive, Strategic-Level Policy for Preventing the Proliferation of Weapon of Mass Destruction (WMD) and Defending Against Chemical, Biological, Radiological and Nuclear (CBRN) Threats, March 2009.



Major Krzysztof Rojek

joined the military in 1985 and holds an MBA from the Military Academy of Technology in Warsaw, Poland. With his background in CBRN, he managed the technology section of the Chemical Laboratory, in the 1st Chemical Central Depot, as its Chief. His postgraduate studies centered on 'Integration and European Security'. In addition, he lectured at the Polish Air Force Academy. He served with the UN mission in Lebanon in 2002–2003 and Liberia in 2004–2005. Major Rojek is currently serving at the Joint Air Power Competence Centre (JAPCC) in Kalkar, Germany where he is the CBRN Subject Matter Expert.

Looking at Our Past

SEAD Factors of Influence

By Major Cosmin Gabriel Vlad, ROU AF, 711st Fighter Squadron

This paper was presented by the author during the 8th International Scientific Conference 'Technologies – Military Applications, Simulation and Resources' organised by the Command and Staff College of the National Defence University 'Carol I', Bucharest, Romania (April 5–6, 2012).

Abstract

The smashing success of the Suppression of Enemy Air Defence (SEAD) packages in Operation Desert Storm seemed to have imposed a standard recipe. The 78 days of the Kosovo war, and especially the F-117 plane crash on the fourth day of the conflict, however, compelled the allied forces to reconsider their SEAD tactics and techniques.

This article will review the systemic issues air forces may encounter when they face an agile and intelligent enemy determined to fight to the end.

Introduction

Since the invention of the airplane, air superiority has become a decisive factor of the conduct of war. "Air superiority is a necessity. Since the German attack on Poland in 1939, no country has won a war in the face of enemy air superiority, no major offensive has succeeded against an opponent who controlled the air, and no defence has sustained itself against an enemy who had air



© U.S. Navy, Jamie Hunter/Aviacom



The new EA-18 Growler is able to detect, jam and destroy air and mobile ground targets, making it the perfect candidate for SEAD missions.

superiority.¹ Although gaining air superiority is necessary to destroy and/or neutralise the Air-to-Air and Surface-to-Air assets. This article will refer only to the latter, namely SEAD.

As shown in a study by Christopher Bolkcom, from the U.S. Congressional Service, over the last decades the amount of effort allocated to neutralise an enemy's air defence has steadily increased.² During the Vietnam conflict, SEAD missions represented 5% of the total number of flights. In Operation Desert Storm, this number increased to about 7% and, just a few years later, during Operation Allied Force, it reached 21.5%. Certainly, some questions immediately arose concerning these statistics: "What factors led to the growth in an air effort as a counter to the enemy's air defences? Is there a way to reduce the number of SEAD missions?" In an effort to answer these questions, the author of this article analysed the aspects that did not happen according to Operation Allied Force plans and examined whether lessons identified have been implemented.

Lessons Identified – Operation Allied Force

In contrast to the SEAD experience during Operation Desert Storm, the initial effort to neutralise Serbian air defences during Operation Allied Force was not as effective as expected. The main objective was the destruction and the neutralisation of as many Serbian SAMs and AAA pieces as possible. It was estimated the Serbs had approximately 16xSA-3 and 25xSA-6 complexes. Learning the Iraqi lesson, the Serbs dispersed their SAM systems and, operated them in an emission control manner and engaged aircraft at low altitudes to achieve a higher kill probability.³ Operating in such a way made it harder to find and destroy SAMs and forced the Alliance SEAD aircraft to remain alert the entire war. This situation resulted in the delay of attacks on some targets deemed too high a risk, which increased the Composite Air Operations (COMAO) packages.

Another problem faced by NATO forces on SEAD missions was the geography. Because of the mountainous terrain in Kosovo, radar aboard the E-8 Joint Surveillance Target Attack Radar System (JSTARS) aircraft could not locate hidden targets, and sensors placed on the U2 and EC-135 Rivet Joint rarely compensated for this.⁴ It was also learned that the well-developed network of underground command posts, buried communication lines, and mobile communication centres thwarted the allies' efforts to attack the communication nodes. Through this communication network, the Serbs were able to transmit data collected by radar stations located in the north to the air defence systems located in the south. This is one of the reasons, at least partially, why the F-16CJs and EA-6Bs proved ineffective as SAM system destroyers in some cases. Both aircraft use HARM to neutralise radar systems that usually operate in the vicinity⁵ of the targeted SAMs but the Serbs were able to separate their SAMs from their surveillance radars.

The preferred offensive tactics to destroy enemy air defences (DEAD) used F-16CG and F-15E aircraft armed with general purpose bombs and AGM-130. To fulfil the missions, these aircraft were placed in holding areas near the tanker aircraft, entering the battle whenever

a SAM threat appeared – so called ‘targets of opportunity’. One of the problems with such DEAD attempts was that the data cycle had to be short enough for the attackers to capture radar emissions before they changed their position. The F-16CJ support aircraft was relatively ineffective in combating the reactive SEAD targets because the time required for detecting the imminent launch of SAMs and to shoot a HARM missile to protect strikers invariably exceeded the flight time required to hit the target.⁶ In all events, by remaining dispersed and mobile and activating their radar selectively, the Serb SAM systems’ operators sacrificed short term objectives and a certain tactical initiative to present a long term operational challenge for allied air operation planners. The result of the Serbs inactivity was that the allies had few opportunities to implement classic Wild Weasel type tactics and attack radars with HARM.⁷

All this raised questions about how effective the Alliance SEAD tactics were and suggests the need for real time information about enemy mobile SAM systems. Although fewer aircraft than expected were shot down during this conflict, the aspects mentioned above point to some systemic problems that need to be solved in the future.

Factors of Influence for SEAD Missions in Future Conflicts

A factor that predicts a major boost in the overall efficiency of SEAD missions is the substantially reduced radar cross section of the new generation of combat aircraft. Once NATO populates the battlefield with these multi-role combat aircraft in sufficient numbers, the greatly reduced radar cross section will increase their survival rate by lowering the effective engagement envelope of the enemy’s radar guided SAMs up to 95%⁸.

The immediate effect would be to limit the opportunities the enemy may have to engage and shoot down such aircraft. Therefore, it was expected the F-22 and F-35 aircraft would be able operate in an area with multiple Surface-to-Air threats without being too concerned of the enemy’s air defence and,

thus, be able to fly at any altitude and attack heading for the most accurate weapons’ employment against surface targets.

However, the JFC of future conflicts now face the threat of new-generation SAMs, such as the SA-12, SA-20 or even upgraded variants of the obsolete SA-3 or SA-6, long before new generation stealth aircraft reach operational readiness in sufficient numbers to make the difference. The F-22 program ended by building 187 aircraft from which the first generation aircraft have limited capabilities, both in weapon systems and their lifespan.⁹ Also the entry into production of the new F-35 multirole aircraft is delayed, increasing the production cost to a level so high that U.S. Senator John McCain remarked: *“I think we should, at least, begin to look for alternatives.”*¹⁰

In 1999, the use of EA-6B Prowler aircraft – NATO’s only available option at that time – raised a series of issues such as: its maximum speed was lower than that of other aircraft within strike packages, the lack of Air-to-Air weapons or, in most of the cases, the lack of anti-radiation missiles which were sacrificed in favour of additional fuel tanks. Operation Odyssey Dawn in Libya marked the first air operation which the Prowlers weren’t used, their place taken by the new EA-18G Growler aircraft. The five Growlers of the VAQ-132 squadron (US Navy) were *“the only air combat platform that delivers full-spectrum airborne electronic attack (AEA) capability along with the targeting and self-defence capabilities”*¹¹. Equipped with electronic warfare pods, the electronically steered array (AESAs) radar and having the capability of using anti-radiation missiles and Air-to-Air weapons simultaneously, the Growler is able to detect, jam and destroy air and mobile ground targets. This makes it the perfect candidate for SEAD missions.

In 2001, two years after Operation Allied Force, General Jumper suggested: *“Instead of sitting and talking about great big pods that bash electrons, we should be talking about microchips that manipulate electrons and get into the heart and soul of systems like the SA-10 or the SA-12 and tell it that it is a refrigerator and not radar.”*¹² Some of the first versions of the cybernetic offensive testing by the U.S. Air Force, and reported as successful, suggest



© U.S. Air Force, SFA Greg L. Davis

A F-16CJ seen in a right turn over South Carolina while flying a training mission.

the feasibility of neutralising SAM systems and other defence systems in ways that do not require strike packages or HARM weapons.

Probably the greatest challenge for this type of air operation will be the use of the new electronic warfare pod, the Next Generation Jammer (NGJ). Besides a greater precision in threat detection and greater efficiency regarding their destruction, the new system will have a new task: cybernetic warfare. Working together with the APG-79 AESA radar, the NGJ will create impulses containing data packages that will be inserted into enemy's data networks, C2I systems and even in the aircrafts' on-board computers.¹³ Initially, it was intended to equip F-35 aircraft with the NGJ, but the delays of this program led to the decision to build a pod that will be used first on the EA-18G Growler and later on the F-35 and UAVs.

Conclusion

Reconnaissance platforms and unmanned combat aircraft, such as the Predator and Global Hawk, fighting from very high altitudes, without facing the threat of short and long range anti-aircraft weapons systems,

combined with space capabilities, will carry out SEAD or DEAD missions without jeopardising crew's lives. At the end of February 2012, 13 NATO countries, including Romania, have announced they will invest in the acquisition of five long range drones, as well as the implementation of a common ground surveillance program in Europe, NATO's Alliance Ground Surveillance (AGS)¹⁴. All this will certainly increase the Alliance's capability of detecting, tracking and, finally, engaging the enemy's mobile weapons, to include the air defence systems. ●

1. John Warden, 'The Air Campaign, Planning For Combat', Pergamon-Brassey's Pub., Washington DC, 1989, p.10.
2. Ch. Bolkcom, Military Suppression of Enemy Air Defenses (SEAD): Assessing Future Needs, CRS, Washington D.C. Updated January 24, 2005.
3. Kosovo/Operation Allied Force After-Action Report, 31 January, 2000, p.64.
4. Kosovo/Operation Allied Force After-Action Report, 31 January, 2000, p.55.
5. Benjamin S. Lambeth, NATO's Air War for Kosovo, RAND Corporation, 2001, p.37.
6. Benjamin S. Lambeth, NATO's Air War for Kosovo, RAND Corporation, 2001, p.70.
7. Tim Ripley, "Serbs Running Out of SAMs, Says USA", Jane's Defence Weekly, 2 June 1999.
8. Benjamin S. Lambeth, Kosovo and the Continuing SEAD Challenge, Aerospace Power Journal – Summer 2002.
9. Marc V. Schanz, The Last Raptor, Air Force Magazine, February 2012.
10. John A. Tirpak, Make or Break Time for F-35, Air Force Magazine, August 2011.
11. Boeing EA-18G Growlers Deployed by US Navy, published online at: http://defense-update.com/20110218_ea-18g-growlers.html
12. "Jumper on Air Power", p. 43, quoted in Benjamin S. Lambeth, Kosovo and the Continuing SEAD Challenge, Aerospace Power Journal – Summer 2002.
13. <http://www.as.northropgrumman.com/products/jammer/index.html>
14. http://www.nato.int/cps/en/natolive/topics_48892.htm



Major Cosmin Gabriel Vlad

graduated the Romanian Air Force Academy 'Henri Coanda' in 2000, and is currently appointed as an instructor for air navigation and air security of the 711st Fighter Squadron, Campia Turzii. He also graduated from the Air Reconnaissance (Izmir Air Base, Turkey) and Advanced Air Force Officers Courses (Boboc, Romania). He holds a master's degree in Human Resources from the University of Craiova (Romania) and a master's degree in Military Operational Art (Air Force) granted by the Command and Staff College of the Romanian National Defence University 'Carol I'. He has more than 700 flight hours in the IAK-52, L-39, IAR-99, MiG-21 Lancer, F-16 and F-15 aircraft.



The European Air Transport Command

A Successful Example for Pooling and Sharing

An interview with Major General Jochen Both, first Commander of the EATC 2010–2012

When the European Air Transport Command (EATC) came into existence, it was said to mark “an unprecedented level of European defence co-operation”. Having been in operation for almost two years now, do you believe the EATC has lived up to this claim and reflects quantifiable savings to the member nations?

Unsurprisingly, the EATC is seen in the contemporary European debate on pooling and sharing as a lighthouse – example. I think this is very much justified by the fact that for the first time ever, four nations, Germany, France, Belgium and the Netherlands, accepted the partial relinquishment of their sovereignty to enable the efficient and effective execution of OPCON over assigned Air Transport (AT) and Air-to-Air

(AAR) refuelling assets; already being used for routine, peacetime missions. And for the future, of even higher importance, are defined levels of authority granted by the nations to the EATC over all aspects of force generation; ranging from employment, training, and exercises to logistical regulations and airworthiness questions. In short, the EATC is the first multinational headquarters which is an integral part of the four Participating Nations' military command structures.

After nearly 18 months of ‘operations’, I assess the achievements of the EATC team as: convincing for the time being, and promising for the way ahead. During the Libyan operation for instance, the EATC planned, tasked and controlled logistical missions of all Partner Nations and supported in all different operational

phases (Non-combatant Evacuation Operation as well as the deployment, sustainment and redeployment of the Partner Nation's forces in support of Harmattan, and Operation Unified Protector [OUP]). Only through this EATC controlled, cross-national, efficient use of scarce military air transport resources, the nations, very much engaged in this operation, were able to maintain the required continuation of high level tactical peace time training for their aircrews. In addition, under OPCON of the EATC, French citizens were flown out of Japan following the tsunami catastrophe in early 2011. And the EATC mission framework allows for routine logistical and training missions 24/7 across the globe, including regular support flights into operational theatres like ISAF and KFOR. Apart from being another successful example of the air forces philosophy of 'centralised command – decentralised execution' the EATC has already been able to establish a common diplomatic clearance regime, is on a promising way towards implementing a common Flight Duty Regulation as well as a definition and contents of aircrew combat readiness levels for all participating nations. Furthermore, the EATC recently coordinated the very first Multinational Aircraft Recovery Exercise, conducted in France, and is very much engaged in support of the European Defence Agency in the preparation and conduct of the European Air Transport Training in Saragossa, Spain.

Our rare quantifiable numbers show that with the transfer of authority of assigned aircraft, the EATC produced more than 45,000 flying hours and planned, tasked and controlled over 7,700 missions in 2011. Additionally, more than 1,150 MEDEVAC-patients have been transported as well as 170 AAR missions were accomplished. Our analysis of the exchange of flying hours also proves a significant and logical increase of cross-national activity. In 2010 there were only about 500 flying hours exchanged by the nations. In 2011 this figure was multiplied by six – to more than 3,100 – which stands for EATC's authority and the will of nations to pool and share.

Hard figures, with respect to cost savings, are generated when nations save resources like infrastructure or personnel and when nations are able to reduce the number of outsourced flights to civilian carriers by

using EATC resources. For instance, the German Armed Forces saved money by closing their former national Air Transport Command and the Dutch Armed Forces by using mainly partner assets when repatriating injured soldiers.

But as the demand for military AT always outweighs the existing resources it is my purpose to support the objective of reinvesting freed resources through efficiently planned and executed logistical missions into the required tactical, mission oriented training of our aircrews. In sum, for the first time ever, nations gave up parts of their sovereignty in 'normal' times to guarantee a more efficient use of scarce resources by pooling assets and sharing capabilities. Our achievements over the past months prove that the EATC concept works.

Mutual trust is an important element in any multinational partnership. Have there been any issues with lack of trust, misunderstandings or national reservations, and if so how have you overcome them?

To gain and maintain mutual trust and confidence is a major task of mine. This is a matter of our own corporate identity as well as an adapted mindset by the military community of the Participating Nations. The solid performance of the EATC, as stated earlier, is surely one of the major determinants for trust earned by this headquarters. In such an organisation individual professionalism and understanding are foremost and commonly accepted prerequisites for success. This was, and is, assured by the team. However, as the EATC was a unique and totally new headquarters, a common set of codes had to be developed and established consisting of multiple parts: Our common culture of operating in the third dimension offered a solid baseline and framework for our functioning, multinational mindset; the language to be used in all aspects of headquarters life and work across the nations is English and specially designed standing operating procedures, describing the internal and external working processes had to be commonly agreed upon and must be enforced. Last but not least, our uniquely developed IT-tool: Management of European Air Transport (MEAT) forms another cornerstone as it guarantees a commonly shared operational picture for all EATC customers.

Even with the great dynamics in early 2011 we have thus far faced no reservations or national caveats. This is fantastic proof of the common understanding of the EATC mission and trust placed in the EATC Team.

How pleased have you been with the level of authority granted to you?

On the Operational side, the transfer of OPCON over a high number of national military air transport assets is a key prerequisite for gaining efficiency and effectiveness through centralised command and control. Nations have transferred a fleet of approximately 130 tactical and non-tactical military fixed wing air transport aircraft consisting of 11 different aircraft types which gives us diversification.

On the Functional side, nations can transfer three different levels of authority (Recommending, Coordinating, and Commanding) to the EATC. Nations have entrusted me with Recommending and Coordinating authority in most functional domains. Currently, I have Commanding authority over the Tactical Combat Training Program and Coordinating Authority for 3 out of 4 nations in the domain of Flight Duty Regulations and Combat Readiness Levels. The intelligently scripted EATC concept ensures that the nation providing the highest degree of authority to the EATC is driving the pace of work inside and outside the headquarters for this domain.

So in the early stages, I was more than satisfied with the levels of authority granted to the EATC. In the future, taking the rather decreasing resources into consideration, I see the urgent need to stress harmonisation

and interoperability requirements. This becomes especially true with the commissioning of the A400M. So I am confident that we will be able to convince nations to entrust us with more authority in the future in the area of force generation. This will also be the path towards reaching full operational capability foreseen for the end of this year.

You've been in cooperation with European Air Transport Fleet (EATF) [a European Defence Agency programme] in areas of shared common objectives; has this been a success and where do you see this relationship going in the future?

By concept, EATC is designed as a nucleus for military AT and AAR and as an integral part of the national military command structures at the same time. Both criteria distinguish EATC from any other organisation so far.

The EATF, as well as the European Air Group (EAG), are also engaged in these areas in a larger European framework. So it was logical to establish close working relationships from the beginning (e.g. participation in Ad Hoc Working Groups-AHWGs) in order to avoid inefficient duplication of work and to gain synergies.

EATC's participation in the AHWG Tactical AT is one example. The common purpose of this WG is to address both, operational and training issues, as well as AT interoperability. Multinational AT tactical training is one of the major shortfalls in Europe. Hence, it is necessary to optimise the use of already existing national training events through multinational participation and to



support in organising training events based on the requirements set by the Partner Nations leading eventually to a European based advanced air transport training course. This is high on the agenda of the European Defence Agency through the EATF and here the EATC will bring in its expertise and authority. This is surely a win-win situation for all parties involved and a key to successful European cooperation.

How much interaction does the EATC have with the NATO command structure and/or the 12 member nation Strategic Airlift Capability/Heavy Airlift Wing (SAC/HAW) at Pápa, Hungary?

By concept, neither NATO nor EU has tasking authority over the EATC. However, the EATC is able and ready to support potential NATO or EU operations. For this, either organisation has to forward its requests for AT/AAR support through one of the EATC nations as a sponsor nation. In addition the EATC could deploy modules as part of larger national or multinational operations centres provided all EATC Nations agree.

Of course, the collocation of the NATO Allied Movement Coordination Centre (AMCC) and the Multinational Coordination Centre Europe (MCCE) at Eindhoven Airbase in itself provides synergetic effects that are used on a day-to-day basis.

Because all EATC nations are involved in the International Security Assistance Force (ISAF) operation, for example, the EATC is tasking and controlling logistical

support AT missions into the Afghan theatre. In order to be able to exercise effective OPCON, it is essential for the EATC to have situational awareness to make timely and appropriate decisions. This becomes even more important for the looming ISAF redeployment which will be a real challenge for the tactical as well as strategic AT community. Consequently the EATC already participates in SHAPE's ISAF Planning conferences in order to optimise its long-term planning for ISAF support flights.

The Netherlands is the only EATC nation to have a share in the SAC/HAW organisation. At present, the use of the NLD C-17 share by the other EATC Participating Nations would generally be possible through the Air Transport and Air-to-Air Refuelling Exchange of Services (ATARES) agreement. But let me point out another aspect of your question: Since the existence of the EATC new processes around new responsibilities and competences have been well established, it is now time for nations to look into the existing 'legacy', national as well as multinational, C2 elements dealing with military air transport in order to save personnel where possible and to streamline structures.

When four of the Movement Coordination Centre Europe (MCCE) nations formed the EATC they took with them a large portion of the MCCE's workload; do you see the MCCE continuing to play an important role in AT/AAR coordination?

On the air side MCCE and EATC have the same predecessor organisation – the European Airlift Centre (EAC). But EATC is now executing a control function whilst MCCE holds a multi-modal coordinating function including land and sea transport and the ATARES regime. So there are considerable differences between both organisations now.

Nevertheless there are obvious overlaps, since MCCE still holds an AT and AAR cell, hosts the Strategic Airlift Coordination Cell (SALCC) and since the EATC also uses ATARES for its flying hour balancing. So far, in order to avoid unnecessary duplications, we established a strong working relationship. The MCCE will in any case continue to play an important role as multimodal coordination centre in the future.





Officers reviewing assets in the mission control room.

What challenges do you foresee in the immediate years ahead and where do you see the future of the EATC going?

First, we need to continue working to earn mutual trust and confidence by our vision and our professional, daily labour. We should not sit and enjoy our achievements, but continue to improve our common processes and procedures extending them towards the incoming A400M with its highly potent multirole function.

Second, I am asking and – based on earned trust and confidence – expecting an increase of authority levels provided by nations to the EATC in the area of force generation.

Third, the EATC will have to play a major role in balancing the flying hours of assigned fleets between na-

tionally requested logistical flights and the tactical training requirements for combat ready aircrews as postulated in the national levels of ambition.

Fourth, I expect the EATC will play an important role in the employment part of the current AAR-initiative of the European Defence Agency.

Finally, EATC and its Participating Nations have to get ready to welcome new partner nations in the EATC community soon. Luxemburg will be the first nation to join, probably by the end of this year. However, one prerequisite for further enlargement will generally be a signed Treaty, which I expect by the end of 2013.

Sir, thank you for your time and your comments. ●

Major General Jochen Both

joined the German Air Force (GAF) in 1972, becoming a F104G ‘Starfighter’ pilot. After several assignments, he completed the General Staff Course and the Senior Course at the NATO Defence College in Rome. After his post at NATO SHAPE he was promoted, in 2003, to Brigadier General as commander of the GAF Academy. From 2005 to 2009 he served on the Air Staff of the MOD, after which he was nominated as Chief of Staff of the GAF Command in Köln. From there he deployed to the HQ ISAF Joint Command as Deputy Chief of Staff Air in Kabul (AFG) from Nov 2009 to Jul 2010. After his deployment, he was assigned as the first commander of the EATC in Eindhoven, in Sep 2010. In Jul 2012 MG Both returned to NATO SHAPE and assumed command of NAEW&C Force Command.





New tankers and receivers are an open door for Air-to-Air Refuelling data exchange amongst nations. A potential clearance between the UK A330 MRTT and the A400M could be exploited by all user nations.

A Happy Marriage But Still With Sorrow

Air-to-Air Refuelling and Interoperability

By Lieutenant Colonel Manuel de La Chica Camúñez, ESP AF, JAPCC

Setting the Scene

We are at the onset of a new NATO-led operation when the popping up of a lucrative and unexpected target offers a great opportunity to achieve strategic effect. Let us imagine for a moment the following J-Chat conversation:

<CAOC Jupiter> Cyrano 31 (FRENCH AWACS) request status?

<Cyrano> As fragged.

<CAOC Jupiter> Pop up target in sector ZA, TST (*Time Sensitive Targeting*) procedures in place.

<Cyrano> Copy pop up target in sector ZA. State your instructions.

<CAOC Jupiter> Re-task Cobra 63 (*CAS*), Weaver 51 (*SEAD*) and Pred 21 (*ISR*) to conduct the operation. TACP (*Tactical Air Control Party*) Ringo 05 will give final TACON.

<Cyrano> We're close to Bingo, requiring RTB in 40 minutes. Magic 41 (*NATO AWACS*) should be enroute to RT (*Refuelling Track*) JEEP. Windmill 11 (*Dutch KDC-10 tanker*) is on station. We will handover to Magic 41.

<CAOC Jupiter> Latest info, Magic 41 is RTB (*Return To Base*) due to a malfunction, request you extend your vul time 3 hours to coordinate the TST.

<Cyrano> Copy all. Crew duty day will support but we'll need 45,000 pounds of fuel to extend.

<CAOC Jupiter> Roger, proceed to RT JEEP for your fuel. Windmill 11 is your tanker, on track.

Moments later, a new J-Chat conversation is initiated after the realisation that the only available tanker is a Dutch KDC-10. Technically this tanker is cleared with the NATO AWACS but not with the French AWACS which has no operational waiver in place:

<CAOC Jupiter> Cyrano 31, how long can you stay on station without tanking? There are no more boom tankers airborne.

<Cyrano> 35 minutes.

<CAOC Jupiter> Cyrano transmit to all players, TST operations are cancelled. Repeat, TST operations are cancelled!

This is a fictitious and rather simplistic vignette designed simply to introduce the topic, however is this scenario plausible? The answer is yes! It is realistic with similar cases and instances where simply changing the aircraft model or the nation involved might lead to mission failure or an increase in complexity. But how can this be? This article will provide further insight to this apparent lack in interoperability, suggest solutions and who will implement these solutions.

Interoperability: The Necessary But Never Totally Attainable Reality

There is nothing new in stating that AAR is a critical enabling capability for current air operations and that interoperability is critical to the efficient and effective use of AAR assets. However, interoperability (just like transformation) is a continuous cycle that has to be constantly (re)developed, with the existing level of AAR interoperability across the Alliance having significant potential for improvement.

NATO has, over a period of several decades, addressed a number of interoperability-related issues notably

the technical aspects. The use of Allied Publications and STANAGs has proved to be the main driver in the standardisation in equipment design and in flying procedures. However there has been little progress made with respect to aircrew training and currency, the training of Air Operations Centre (AOC) AAR planners and with technical compatibility clearances. This article will concentrate on the latter issue of technical clearances.

Although identified long before the Libyan crisis arose¹, Operation Unified Protector (OUP) once again highlighted the Lesson (Never) Learned of the importance and the availability of technical compatibility clearances. The AOC planners were faced with a complex challenge: to match the receivers' fuel requirements against the available tankers drawn from a multi-national coalition with all the associated restrictions and national caveats. To add to the difficulties encountered during the initial phase of OUP, many of the National Annexes (the initial reference point for technical compatibility information) contained within ATP-56 (ATP-3.3.4.2: NATO AAR Procedures) were



outdated and were lacking 'Nation A' tankers with 'Nation B' receiver combinations. They simply don't exist; worse still they even lacked receiver-tanker information from the same country! This limited the dynamic planning process and led to inefficiency in the mission execution. The situation was only resolved with the signature of last-minute bilateral waivers with specific national authorities assuming the risk. However the waivers only approved the AAR clearances on a temporary basis and restricted to the period of the operation.

OUP did demonstrate that NATO is operationally AAR capable however also demonstrated that NATO had not prepared the requisite staff homework in the peacetime prior to this, or any, operation.

The Problem: Origin, Consequences and Reasons

To (technically) clear a particular tanker-receiver combination requires a flight test program that is generally

considered minor in comparison to other more complex test programs e.g. to integrate weapons and/or sensors. The AAR programme comprises engineering analysis along with associated ground and flight trials. This process generates AAR compatibility data and should finish, when successful, with the tanker-receiver combination cleared within a certain flight envelope. Normally this activity is done unilaterally by a single nation clearing its own tankers with its own receivers or bilaterally between a tanker and a receiver type belonging to different nations².

It is necessary to clarify that we're only focusing on technical compatibility and not a full AAR clearance. Full clearance requires more than just the certification of the technical compatibility; it also requires a legal and financial framework that allows the exchange of AAR services amongst nations. However, the technical compatibility is the logical first step before considering anything else and probably the most complicated because the other aspects can be easily handled when there is a political will to do it (fighting in coalition normally creates such a will).

OUP was an AAR interoperability success; however, many technical clearances were missing at the beginning and last minute approvals were necessary. Image taken from a CC150 of two US F/A-18Fs after refuelling.





The Typhoon community, through NETMA, has spread clearances for all user nations. However, some contingency clearances produced for the Libyan campaign are still in the process of being extended.

The current problems have arisen principally because neither the generated data nor the compatibility clearance is shared with third nations who may use the same type of receiver and/or tanker. This lack of data exchange has resulted in a lack of bilateral clearances and to the duplication of effort leading ultimately to a lowering in interoperability levels.

But why is this happening or being allowed to happen? There is no singular explanation rather a combination of causal factors: individual national perspectives above cooperative approaches, nations not being proactive, financial constraints that leave clearances to the very last moment, reluctance to share data if there is not an immediate benefit in sharing, the diversity of tanker models (fragmentation) making it very difficult to clear one receiver with all tanker types, different national certification authorities and criteria, and commercial industries' lack of willingness to 'give away' potentially profitable proprietary data rights.

The reasons mentioned above are, in some cases, used as justification for nations to do nothing to increase their technical clearances. Even though this problem is very complex it is not insurmountable. The approval and application of waivers during OUP invalidates all of these excuses and proved that a lot more can and must be done.

Feasible Solutions

The solution, without a doubt, has to come from the willingness of nations to cooperate more and to exchange technical compatibility data more openly. Through a read-across strategy, based on the same type of receiver or tanker³ and independent of the national ownership, the clearance process would be simplified at the unilateral, bi-lateral and multi-lateral levels.

The immediate future will present a perfect opportunity for this read-across strategy. The AAR community is becoming less fragmented with the procurement of new tankers and receivers to replace legacy platforms. A *'technically cleared on one, technically cleared for all'* principle should be put in place with the possibility to have all receivers technically compatible with the maximum number of tanker models and vice versa.

This cooperative approach will have direct and indirect benefits in different fields. From a national point of view, the will to share technical data should be perceived as a win-win scenario where nations give and receive information at the same time and rapidly gaining technical clearances for their platforms. From a broader perspective, nations will save money, effort and resources that can be reallocated to other tasks.

From the Alliance point of view, it would enhance interoperability and thus make AAR operations more efficient, flexible and easier in both its planning and execution phases. Most importantly, this will ease the dependence on last minute waivers and inform risk management. From an industrial point of view, commercial industry may initially believe that giving their customers (the military) the right to share technical clearance data will be giving away a potential source of revenue. An alternate solution would involve including the data copyright in the initial purchase of new tankers and receivers, enabling full clearance upon delivery, which would make their products more attractive to potential customers.

Who Has the Hammer?

One year on from the conclusion of OUP, the AAR community has added impetus to alleviating the clearance process with a bottom-up approach providing some progress⁴. However, if a read-across strategy is to succeed in reinvigorating the technical clearance process, a top-down approach is required, involving high-level operational and certification authorities. Otherwise the current efforts may lose momentum and stall, or be diluted with the passage of time, and succumb to the amnesia (read Lessons Identified) NATO was suffering from before OUP.

To contribute to this initiative, ATP-56 (as the principal AAR reference document) will play a facilitating part. The custodians of ATP-56 are to design and promulgate an electronic compatibility matrix, to include every current tanker/receiver and nation-to-nation

combination. At present all national clearances are in separate annexes; the matrix will provide a one-stop document cross-referencing information from all nations. All cleared combinations will have attached

“Operation Unified Protector did demonstrate that NATO is operationally AAR capable however also demonstrated that NATO had not prepared the requisite staff homework in the peacetime prior to this, or any, operation.”

hyperlinks that link to national or bilateral documents and/or data giving details about the specific clearance. The final product will be a repository from which nations can share information.

But this repository will only be useful as a common planning tool if nations are willing to contribute the most current information. In the end, individual nations have the final word and hold the two keys to success: proactivity and the involvement of higher-level authorities. ●

1. 'Air Refueling Publication Provides NATO Nations Better Combat Effectiveness.' AFNEWS electronic bulletin, April 2007. Available from <http://www.af.mil/news/story.asp?id=123049856>; INTERNET. Also in: Joint Air Power Competence Centre, 'Air-to-Air Refuelling Flight Plan.' February 2011.
2. There are some cases where the clearance process can be managed by a multinational agency working in the benefit of several nations, all of them users of the same type of aircraft. A good example are clearances issued for the EF-2000 Typhoon through the NATO Eurofighter and Tornado Management Agency (NETMA).
3. A receiver or tanker type can have different variants that make them not identical so a direct validation of data is not always possible. AAR is especially affected by changes in fuel and flight control systems. Nevertheless the variants differences normally aren't so severe to impede the use of existing data to make the clearance process at least easier.
4. European Defence Agency (EDA) is currently promoting one initiative among its member nations to increase efficiency in the existing European tanker fleet by the exchange of AAR compatibility data with the aim to have more technical clearances available.

Lieutenant Colonel Manuel de La Chica Camúñez

joined the Spanish Air Force in 1984 and graduated from the Air Force Academy in 1989. As a fighter pilot, he logged more than 3,000 hours in seven different aircraft, predominately the C-101 Aviojet, EF-18 Hornet and EF-2000 Typhoon. While with the Typhoon, he commanded the 111th Squadron at Morón Air Base, Spain. He graduated as a staff officer in 2002, assigned to the Spanish Plans Division, tasked with new procurements. He has participated in Operations in Bosnia and Kosovo as an EF-18 pilot and in Afghanistan in Herat as the FOB Plans and Operations Chief. He was assigned to the JAPCC in August 2010.





Our Vision:

In Space Communication we pioneer with passion and strive to be the number one partner for your success. Our solutions set standards that open borders, and connect people worldwide.



Tesat-Spacecom GmbH & Co. KG
Gerberstrasse 49
71522 Backnang, Germany
www.tesat.de
info@tesat.de



High Technology for the Global Satellite Market

Over the course of five decades, Tesat-Spacecom has developed in-depth expertise in manufacturing of payload equipment for communication satellites and has established itself as a clear European market leader. On its 52.000m² premises in Backnang, Germany, the almost 1200 employees develop, assemble, integrate, and test systems and equipment for telecommunication via satellite. To date, more than 500 space projects have been completed.

Our product offerings encompass highly reliable equipment as for example

- Travelling Wave Tube Amplifiers
- Input and output multiplexers
- Solid-state power amplifiers
- Modulators & Waveguide Switches
- Laser Communication Terminals

which along with complete systems are delivered globally to all leading satellite manufacturers. Therefore, we offer the complete communication technology necessary. More than half of all communication satellites in orbit have Tesat equipment on board.

We are convinced that in the future global communication will only be viable with the incorporation of space. Therefore, as the first organization in the world, we are developing and delivering equipment for optical broadband communication in space. Using laser, these terminals can transmit data and images between satellites and from satellites to earth.

Given our competitive position in the commercial satellite market and the quality standards required of us there, our products are now used more frequently in the various satellite-based systems of the security and defense sectors in Germany, Europe, and the United States.



Too Good for Comfort?

Air Power's Battle Against Rising Expectations

By Lieutenant Colonel Harald Høiback, NOR AF, Norwegian Defence University College

Introduction

To be perfectly honest, very few world class thinkers have been attracted to Air Power strategy. I don't think many people, however, are aware of how close we once came. At the end of his first term at Cambridge, Ludwig Wittgenstein approached the already famous Bertrand Russell and asked him: "Do you think I'm an idiot?" "Why do you ask?" a bewildered Russell replied. "Because if I am, I'll become an aeronaut. But if I'm not, I shall become a philosopher."¹ Eventually, young Ludwig made his name in philosophy, and not in aviation. Good for him, as the life expectancy of an aviator was rather short at the time he posed the question, in 1911.

Another world class thinker that did not delve into air power strategy was Friedrich Nietzsche. He did, however, mention *pessimism of strength*, which is exceedingly applicable to Air Power doctrines of the current era. The aim of this article is, therefore, to air a concern that Western Air Power has become so capable, efficient and accurate (so strong) that it is in danger of working against us. Not physically, but mentally. Not by others, but by ourselves.

Pessimism of Strength

Nietzsche's philosophy is of course rather abstruse and complex. Nonetheless, we can use his thoughts as inspiration and as a mental punching ball, even though we don't buy, don't understand, or don't know everything he said or wrote.

In *The Birth of Tragedy*, Nietzsche wondered why the ancient Greek bothered to produce tragedies at all. The free men of Athens were a very healthy and vivacious lot indeed, so why this inclination towards tragedy and sadness? Nietzsche asked: "Is there pessimism of *strength*? Is there an intellectual preference for the hard, gruesome, malevolent and problematic aspects of existence which comes from a feeling of well-being, from overflowing health, from an *abundance* of existence? Is there perhaps such a thing as suffering from superabundance itself?"²

The point here is that the Western world has become so dominant in the air that it is hard to see why we should have a single worry in the world, concerning Air Power. However, and this is this article's main point,

since we are so technically superior we are prone to make demands beyond comprehension. Even if we are able to win wars without losing a single soldier or airman, and even if we wage wars *almost* without collateral damage, people tend to ask; is this all? Why wasn't it done quicker, leaner and cleaner? Our ability to 'deliver' Air Power is almost beyond imagination, yet still it is possible to wish for more, much more.

When scrutinising modern Air Power, it is important to remember where we came from. What could we stomach in the good old days?

Baby Killers

In a famous anecdote from the Second World War, the commander of The RAF Bomber Command, Air Marshall Sir Arthur Harris, was pulled over by a police officer for speeding with his sports car. Harris was warned that he could kill somebody if he continued to drive that way. Harris, allegedly, answered tersely: "Young man, I kill thousands of people every night."

It was a quip, but nonetheless true. Bringing the war to Germany literally meant bringing it to German grandmothers and toddlers, as well as the German war machine. Not a pleasant thought, but something done to pursue a higher goal.

The American general Curtis LeMay was in the same business as 'Bomber' Harris, and had as Harris few scruples about telling people what he, and his men, were actually doing: "We knew we were going to kill a lot of women and kids when we burned that town. Had to be done."

Obviously, nobody longs for *that part* of the past of military aviation. The nostalgia of *Memphis Belle* and *Vera Lynn* and all of that can give us all a longing for the past, even those of us born several decades later, but no one yearns for the firestorms, the nukes and the napalm. Consequently, we should consider ourselves a lucky lot, since both the threats we are currently facing, and the technology we have at our disposal, allow for precision guided attacks. Presumably we would not have been in our present position without the likes of Harris and LeMay.

Has modern Air Power become so dominant that our view has become too narrowly focused?

The Melancholy of Victory

Why then, are the 'users' of modern Air Power not happier? Why do we see examples of self-flagellation among airmen and politicians? The fact that our opponents try to hold us against impossible standards is part of the expected propaganda war. Another question entirely is why we aim at such unattainable standards. Why do we aim for the impossible?

I think it is in the nature of man to always yearn for more. The Olympic motto, *Citius, Altius, Fortius* (faster, higher, and stronger) captures this drive fairly well. This urge has brought much happiness to the western world in the shape of, for instance, lavish leisure time, vastly improved healthcare and relatively luxurious living conditions. Nevertheless, we always ask for more. That is how most of us are. And if we don't know exactly what to ask for, we tend to turn our power inwards and stare at "the hard, gruesome, malevolent and problematic aspects of existence".³

I am, unfortunately, not in a position to change human nature. What I can do, however, is to suggest some caveats to doctrine. Caveats are not always welcome, but I think it is better to be frank about those we have.

Five Caveats of Air Power

All Air Power doctrine should, in one way or another, state the five caveats listed below. They will not change the way we act, but the way we think and comprehend. The quintessence of them all is that everything, including Air Power, has its limits.

Caveat No. 1: War is a Beast, Not a Machine. War has a tendency to take a life of its own, or in the words of Richard Betts: "The *purpose* of war is to serve policy, but the *nature* of war is to serve itself."⁴ War is not a machine that produces the same *objet d'art* invariably and perpetually. Rather, it is a living and breathing 'beast' that we try to manage as best as we can. Starting a war is similar to letting a dog into the hen house in order to chase out an intruding fox. The point being: don't let the dog in if you haven't tried all measures to get the other carnivore out.

Caveat No. 2: War is Undertaken by Collectives, Not by Individuals. Understandably, it is the men and women in flight suits that grab most of our attention. These individuals, however, would be sitting targets without scores of other people assisting. Hence, unless they have committed a crime or are under suspicion of having done so, we should not treat our pilots as individuals with personal liability for what





© U.S. Air Force

The B-2 Spirit can drop up to 80, 500 pound GPS guided bombs.

they have done. It is NATO as an institution that is responsible for its actions, and, as a collective entity should be held accountable.

Caveat No. 3: ‘Where’ and ‘Why’ Have Become More Important Than ‘How’.

A generation ago, both the means of navigation and the bombsight made your target almost irrelevant. The probability of a direct hit was low, unless it was an area target such as a town or railway yard. The main problem was getting to the target area without heavy losses. Today, however, we usually hit where we aim, and the drive time (navigation) to the target area has almost become a no-brainer. Consequently, we now have to put as much effort and competence into intelligence and targeting, as into the flying itself. Hence, the ‘where’ and ‘why’ deserves at least as much consideration as the ‘how’.

Caveat No. 4: Bombs Destroy Things. It is of course self-evident, but some people seem to forget this: bombs, even precision guided bombs, destroy things. Consequently, you cannot build things or nations with bombs. Occasionally, however, what bombs can do is ward off aggressors and contribute to a safe environment for the building to occur. Even if bombs destroy things, they indirectly assist those who are building a better future.

Caveat No. 5: Do Not Expect Miracles. This caveat is related to caveat # 1. Do not expect predictable effects from the use of arms. The ever present friction of war makes, as we know, the simplest things difficult. Instead of concern towards Air Power’s inability to produce political miracles in remote corners of the world, we should be pleased of our ability to avoid major errors and contribute in making peoples’ lives better.

Conclusion

Our friend Nietzsche warned that if you gaze into the abyss, the abyss will gaze back at you. Hence, we should stop staring down at the gutter, and start gazing up into the stars. We *are* good; even outstanding at times. We can still improve, and always will, but we should not feel guilty with the inability to produce miracles. Instead, we should be proud of our ability to produce outstanding results. *Per ardua ad astra!* ●

1. John Heaton, *Introducing Wittgenstein* (London: Icon Books, 2009) p.12.
 2. Friedrich Nietzsche, *The Birth of Tragedy and Other Writings* (Cambridge: Cambridge University Press, 1999) p.4.
 3. Ibid.
 4. Richard K. Betts ‘Is Strategy an Illusion’ *International Security*, Fall 2000, Vol 25, No 2, p.37.



Lieutenant Colonel Harald Høiback

is currently a faculty advisor at the Norwegian Defence University College. He was trained as a fighter controller and has performed duties as a crew chief, intercept controller and instructor. He also served in the Department of Security Policy in the Norwegian Ministry of Defence. Høiback is a graduate of the Royal Norwegian Air Force Academy and holds a PhD in philosophy from the University of Oslo, and a master’s degree in history from the University of Glasgow. He is the author of *Command and Control in Military Crises* (2003) and has published numerous articles on military history and military thinking.



Cooperation between RC South, Netherlands and Australian engineers in Tarin Kowt with the arrival of spare parts on a IL-76.

© AVDD, Fred Warner ELNT

NATO Logistics Doctrine

Making it Relevant

By Lieutenant Colonel Kees Pistorius, NLD AF, JAPCC and Major K. Jason Hunt, USA AF, JAPCC

“We’re going to teach you how it’s supposed to be, not how it is!”

NATO School Oberammergau (NSO) Expeditionary Logistics Course instructor

Has NATO Logistics Doctrine Been Outpaced by Reality?

There’s a growing sense that the current economic and political climate means more than ever that nations should be working together to achieve common goals, which is highlighted by the new strategic catch phrase ‘Smart Defence’. But if you pick up the NATO Logistics Handbook (NLH), published in 2007, you’re in danger of finding the same message throughout!

The seriousness of logistics cannot be overstated as many wars have been lost due to lack of logistic support. With the future of warfare becoming increasingly complex and asymmetric, Commanders will require demanding logistical resourcefulness and organisational skills of very high order. We expect future warfare to again emphasise the need for multinational operations and coordination in order to engage in high operational tempo under considerable time constraints and political pressures. From the NSO quote, you can see that the reality of current NATO multinational logistics operations is far removed from how doctrine dictates NATO logistics should be conducted.

To meet NATO’s changing logistics requirements; nations require resource efficient, relevant and reliable common logistics doctrine with teeth.

To Be or Not to Be Doctrine

Is the NLH even worth the paper it's written on? It's not doctrine, but it's jam-packed with overarching, multinational logistics planning concepts and visions. It cites tested logistics solutions designed to work if properly planned, applied and coordinated, yet in practice, it's largely ignored during the NATO Operations Planning Process.

“The manpower sent by TCN to man the JLSG will likely be experienced logisticians, but more and more often, they are not NATO logisticians.”

NLH disclaimer: “The NATO Logistics Handbook is not a formally agreed document, and should not be quoted as a reference. It does not necessarily represent the official opinion or position of NATO, the nations, commands or agencies on all the policy issues discussed.”¹ In this article, we will quote it regardless.

To successfully deploy a multinational force, nations must work together from the early planning stages. “NATO operational experience demonstrates that once national logistics support structures have been established, it is likely to prove more difficult to move towards multinational logistics solution. Therefore, multinational logistics solutions should be pursued at the outset of the logistics planning process.”² This quote, although not defined as doctrine, is a clear example of a fundamental multinational logistics principle, outlined in the NATO Logistics Handbook yet ignored in practice. The recent Libyan conflict highlighted this challenge in the Logistics Movement and Transportation (M&T) realm. Approximately three months into the conflict, after nations had already developed their own movement and lift solutions, NATO held one of its first meetings to discuss unity of effort for M&T. In line with the aforementioned quote, this meeting proved the difficulties of merging efforts after the conflict had begun. If this fundamental logistics principle was contained in ratified NATO doctrine, and nations were held to it, the multinational logistics planning and coordination could have started with, or indeed prior to, the conflict; as mentioned in the Comprehensive

Operational Planning Directive (COPD) thus enabling multinational logistics operations to support the war fighters at the outset of the operation.

Common Logistics Doctrine

Common logistics doctrine is a key concept and enabler to the war fighter. When nations have difficulty translating doctrine between the branches of their own national services, can we expect to come to a common understanding of NATO doctrine among 28 different nations? Not, it seems, with any sense of urgency.

Current NATO Logistics doctrine has remained largely unchanged since the Cold War. Existing NATO doctrine supports only Collective Defence (Article 5) and Crisis Response Operations (non-Article 5) missions, which leaves a lack of NATO doctrine in support of operations such as were conducted over Libya. The development of NATO doctrine appears to be reactive, meaning that we don't even begin to develop it until we recognise problem areas or lack of directives in certain situations and scenarios. Re-deployment doctrine is a prime example: the drawdown of ISAF forces in Afghanistan and subsequent full scale re-deployment is already underway and yet development of NATO re-deployment doctrine began only a few months ago. In fact, it took four months to produce interim guidance for the Troop Contributing Nations (TCNs) and the Component Commander, meaning that those nations already re-deploying are operating purely under National doctrine; doctrine which by definition doesn't necessarily account for Alliance concerns, Common Logistics Pictures, economic savings, or collective responsibilities. Why does it take so long to promulgate and ratify NATO doctrine?

M&T doctrine³ has taken years to promulgate among nations. Major disagreements among nations have focused on seemingly small issues such as whether to include text regarding multinational organisations that have been specifically designed to aid in multinational coordination, efficiencies and planning. The exclusion of these types of organisations in doctrine tends to perpetuate an independent approach and potentially skyrockets national costs. As an example, the Land Transportation Cell within the Movement

Coordination Centre Europe (MCCE), devoted to coordination of European Nations' Land transportation requests, is severely under-utilised. By solidifying this organisation in NATO doctrine and ensuring that nations know and understand the benefits which it provides, it may be possible to demonstrate the advantages of international cooperation and therefore overcome their national tendency to work alone.

National Logistics is Not NATO Logistics

The same effect happens when there is no related NATO doctrine and nations plan within their own guidelines. Under these circumstances there is a potential loss of agreement and conformity. National doctrine, at least for NATO nations, should mirror NATO doctrine. Another example of the multinational approach within NATO is the Joint Logistics Support Group (JLSG). The JLSG is not just a concept anymore. It consists of three elements on a component level. Fundamentally a sound concept in terms of Logistics management, structure and command authority, there are some notable flaws in the method in which it's employed. The manning of the JLSG lacks proper doctrine and training to back up its very existence, an on-going problem which has existed for approximately four years. The manpower sent by TCN to man

the JLSG will likely be experienced logisticians, but more and more often, they are not NATO logisticians. Traditionally, they don't know enough about NATO logistics doctrine, which tends to produce planning within national limitations and constraints. Once these flaws are fixed, the JLSG will play a more important role in the coordination of the logistics supply chain between homelands, TCNs and the battlefield. However, this organisational change is not the only required change to improve the overall logistics within NATO. As the JLSG is considered as an enhancement for NATO joint logistics, it must be incorporated in current NATO logistics doctrine.

As a further example, in the absence of doctrine for deployment planning, SHAPE requested that TCNs use the Logistics Functional Area Services (LOGFAS) as a means of asset visibility and production of a Multi-national Detailed Deployment Plan for a particular operation. Since the use of LOGFAS by nations is not mandated by doctrine, nations who were either not trained, not aware, or unconcerned, chose to ignore the request. Why is there no NATO doctrine for deployment planning agreed upon by the nations? As previously mentioned in JAPCC Flyer Ed 4, nations are still not compelled to utilise LOGFAS, and instead employ their own systems. In both of these examples, doctrine does not yet exist and we as independent nations revert to our own systems and training. What are the consequences?



First combined NLD/USA redeployment convoy from Tarin Kowt to Kandahar Airbase.



Consequence of a Doctrinal Vacuum

The short answer is an 'out of focus' Common Logistics Picture (CLP), which is the last thing NATO needs. The CLP becomes 'fuzzy' as a result of Nations' reluctance to divulge operational logistics information. This leads to an unclear understanding of each national logistical support chain, giving the NATO Commander no real visibility over logistics troops, capabilities and assets with which to make operational decisions. Examples include: aircraft status; munitions availability; fuel consumption; and M&T requirements for cargo and personnel. The NLH under Logistics Policies and Responsibilities states: "The NATO Commander coordinates support among contributing nations and with the host nation and retains the responsibility for coordinating the overall logistics effort even when participating nations rely solely on national logistics."⁴ To accomplish this correctly, a Multinational Detailed Deployment Plan (MNDDP) should be coordinated with the aid of National Detailed Deployment Plans (NDDPs). This would focus the CLP and provide the NATO Commander the right information needed to succeed.

The NLH further states: "The NATO Commander at the appropriate level must be given sufficient authority over the logistic resources necessary to enable him to receive, employ, sustain and re-deploy forces assigned to him by nations in the most effective manner."⁵ One wonders if the NATO Commander ever really gets this authority when nations deploy by national lines of communication. If nations cannot effectively coordinate resources back to a NATO Commander, how can they coordinate logistics resources between themselves and other nations? Poor communication and coordi-

nation degrades the mission, the CLP, command and control, and collective responsibilities. Doctrine and the means to enforce its use should be part of that answer.

Discussion/Recommendations

Wouldn't it be nice to open a classroom lecture on NATO Logistics with "we're going to teach you NATO Logistics, period". We don't see how this is possible unless we successfully make doctrine relevant. Pick up a NATO Logistics Handbook sometime, the principles discussed – use them! These should be the foundation of all NATO Logistics Doctrine.

Updating outdated doctrine is essential to making it relevant to tomorrow's challenges. Bringing more doctrine on line where none exists (in the case of re-deployment) is critical, but unless nations are mandated to use this doctrine, tested, and assessed, this process is not necessarily value added. Let's build a multinational logistics model that works for NATO nations during normal operations. If NATO gets it right, it won't be hard to encourage multinational logistics use during times of conflict.

We should ensure that NATO and national doctrine don't conflict and reference any NATO logistics doctrine within the body of national logistics doctrine to reinforce the ideas of multinational cooperation. NATO should aggressively develop new doctrine where none exists. When a nation ratifies NATO logistics doctrine, they are involved by establishment, they agree to the terms, they identify to other nations a willingness to work under common logistics rule sets, yet they pick and choose when to abide by these rules. Based on

the latter, and considering long lead times associated with doctrinal ratification, NATO should more effectively apply AAP-03 specifically the majority rules section of promulgation criteria.⁶

Once NATO successfully updates logistics doctrine it must be disseminated throughout every level of each NATO Logistics function. Nations should be tested on their ability to apply NATO Logistics doctrine to their operations. This process should successfully measure and monitor the use and compliance among nations of NATO Logistics doctrine. There are currently no established methods and no consequence for those who choose not to follow. Considering this leads to 'fuzzy' logistics practices, perhaps NATO should consider a more robust tactical evaluation at the basic logistics level to assess doctrine adherence in these fields. At the very least, NATO must coordinate Logistic/M&T information flow (MC documents, doctrine, STANAGS, etc.) to ensure that nations can at least find the required information.

As a major stakeholder in any multinational logistics model, the JLSG should be enhanced and be heavily involved in the operational planning starting from the beginning to the end of any operation. With so much to offer the TCNs and the NATO Commander, the JSLG has to be stood up before the start, and manned with

experienced NATO trained logisticians, versed on all facets of NATO logistics doctrine. NATO logistics doctrine should dictate this.

"NATO should encourage national and NATO authorities to develop, agree, and implement common concepts, doctrines, procedures, criteria and designs, under a collective responsibility, to enhance the Alliance's operational effectiveness and improve the efficiency in use of available military resources. This would build together a basis for flexible and efficient use of logistics support, thereby contributing to the operational success."⁷ Another useful thought from the NLH ...

Final Thoughts

Lastly, NATO needs to update the NATO Logistics Handbook, ratify it amongst all nations, and make it a legitimate baseline document. Let's get Logistics doctrine back to how it should be, relevant and useful tied directly to the COPD! ●

1. NATO Logistics Handbook – April 2007 – International Staff, Defence Policy and Planning Division, NATO HQ.
2. NLH page 93.
3. Allied Joint Publication 4.4(B) 'Allied Joint Movement and Transportation Doctrine' is in its 4th year of discussions. AJP 4.4(A) is the current ratified doctrine, now 7 years old.
4. NLH, Page 84, Logistics Policies and Responsibilities.
5. NLH, Page 83, Logistics Principles.
6. AAP-03 Production, Maintenance and Management of NATO Standardization Documents Edition J, Version 2, section 2.5.4 (November 2011).
7. NLH, page 83, Collective Responsibility.



Lieutenant Colonel Kees Pistorius

is a Movement & Transportation officer in the Royal Netherlands Air Force. He has held posts in the Netherlands Missile Group, the Tactical Helicopter Group and Air Force Command. He is currently assigned to the Joint Air Power Competence Centre as a Logistics Subject Matter Expert.
Email: pistorius@japcc.de



Major K. Jason Hunt

is a United States Air Force Logistics Readiness Officer with over 16 years of operational logistics and Logistics Planning experience. He is currently assigned to the Joint Air Power Competence Centre as a Logistics Subject Matter Expert.
Email: hunt@japcc.de



Making Ready: Practical Considerations for Space Coordinating Authority

By Major Phil Verroco, USA AF, JAPCC

The classic Air Power book ‘The Air Campaign’ by John Warden III first published in 1988 does not address space operations “primarily because the operational level commander has no direct control over space assets.”¹ By and large this remains true today. But nearly 25 years later, operational-level leaders and military planners need to understand both the capabilities and vulnerabilities wrought from

or through space because successive generations of engineers and operators have steadily incorporated space-based services (often invisible to the end user) into almost every aspect of our operations.

One of the official NATO documents which recognise this fact is Allied Joint Publication (AJP) 3-3(A) Air and Space Operations. This document includes a chapter

on joint military space operations with Section II of Chapter 6 identifying seven key tasks conducted by the Space Coordinating Authority (SCA). The SCA is “the single authority within a joint force to coordinate joint space operations and integrate space capabilities.”² For a regional operation, the Joint Force Commander (JFC) is granted the authority to appoint an SCA to “facilitate unity of effort with member-nation space operations and military component space capabilities.”³

The purpose of this article is to evaluate the specified SCA tasks identified in AJP 3-3(A) in order to provide recommendations for those that may conduct SCA for the Alliance.

Determining, Deconflicting and Prioritising Military Space Requirements for the Joint Task Force (JTF)

Space services give the commander another set of tools to meet objectives. The key requirement is to evaluate the commander’s objectives and tasks to understand where space services are required or assumed. For example, if the commander plans to conduct dynamic targeting based on remotely piloted vehicle operations flown from beyond line of sight; the SCA should understand the space services required to enable that key aspect of operations. Involvement in the development of strategy to task or a thorough review of the strategy to task matrix is essential. Space tasks may be specified, but it is more likely they will be implied as an underlying force enabler. The SCA must know when space services either are, or should be, part of the mix.

Deconfliction in this context could occur outside of theatre. For example, many satellites require upkeep that may make them unavailable for a short time. These activities could be compared to computer patches that are loaded from time to time to improve performance or security. Cyber professionals normally deconflict by pushing patches during non-business hours, minimising disruptions. When the communication to the space operator is good, pre-planned satellite maintenance can usually be deconflicted so as not to impact the mission.

When prioritising military space requirements consider two questions:

1. How important is the task to overall mission accomplishment?
2. How important is the use of space to the accomplishment of the task?

It may be that although the task is of great importance, the requirement for space is low. For example, there may be multiple and redundant mechanisms available to conduct the task. Conversely, the task may be of lesser importance but a space based solution is the only one available to the JFC.

Recommending Appropriate Command Relationships for Space to the JFC

Space assets usually support multiple users simultaneously. The nature of space operations will normally lead to a circumstance where the most appropriate Command and Control (C2) model is a Community of Shared Interest⁴. In such circumstances, the commander is not likely to be given direct operational control of any space asset.

“Space targets are prime reminders that targeting need not necessarily mean bombing or otherwise physically destroying something.”

This is not an absolute. When portions of the space architecture on the ground are within the joint operating area, a direct command relationship could be warranted. For example, if there were a system dedicated to monitoring a commander’s satellite links for interference, it might make sense to recommend a direct C2 relationship. The desired outcome is to make sure the commander has the right authorities to perform the mission. However, along with those authorities comes the responsibility to C2 the assigned assets. The SCA will need to weigh the delay associated with asking someone outside of the chain of command for support against the actual capacity to directly plan and execute specific space operational tasks.



A Space Target destroyed by NATO.

The SCA could also recommend pre-established trigger points in a high threat environment to determine which entity will coordinate protection actions over and above the inherent right of self-defence. Coordination between agencies engaged in providing and protecting space services may take a significant amount of time, particularly if the planner does not begin consultations early on. For example, a satellite in geosynchronous orbit may support multiple theatres simultaneously. Protection efforts for one theatre might negatively impact another. What impact does that cause the supported JFC? Further, numerous organisations from the JFC to the satellite owner may have diverging priorities. For instance, a commercial provider would naturally weigh the continuation of economically lucrative services against the JFC's

protection requirements. Addressing these kinds of scenarios up front, when time is available, should enable a quicker response when time is limited.

Helping to Facilitate Space Target Nomination

A 'space' target is one that helps the commander achieve and maintain space superiority. In Operation Unified Protector, NATO destroyed satellite television antennas that the Gaddafi regime was using to "mobilise its supporters against civilians and trigger bloodshed."⁵ This is a doctrinal example of an offensive space operation.⁶ The SCA should submit intelligence requirements pertaining to the adversary use

of space, and their ability to limit Alliance use. Access to space services is widely available and many nations, non-state actors and even private citizens are enthusiastic consumers.

'Space' targets are prime reminders that targeting need not necessarily mean bombing or otherwise physically destroying something. If a neutral third-party provider were supplying an adversary with space services against NATO's interests, then a legally acceptable course of action would have to be developed to deny those services. Had the Gaddafi regime used satellite antennas in another country to communicate with their forces, bombing them would not have been an acceptable course of action.

Maintaining Space Situational Awareness

Space Situational Awareness (SSA) is defined as "the requisite current and predictive knowledge of space events, threats, activities, conditions, and space systems status, capabilities, constraints and employment to enable commanders, decision makers, planners and operators to gain and maintain freedom of action in space through the spectrum of conflict."⁷ As the definition above makes clear, SSA is not simply sensor data from radar and optical sites. However, gaining SSA in the NATO environment is complicated by the sensitivity of space activities and the reluctance of contributing nations to share information. Further-

"Interoperability between space and terrestrial forces starts by recognising the inherent advantages and disadvantages of operating in the different domains."

more, there is no NATO clearing house for the compilation and dissemination of SSA. However, SSA remains essential because many space services are integrated at the engineering level and are incorporated into equipment our forces use every day. Other services are available commercially via commercial receivers. Sometimes problems with hardware and/or software require at least an interim tactical solution.

For example, a software upgrade at the satellite might impact certain receivers. Knowing and communicating this potentiality is a subset of SSA. There are agencies from NATO nations, such as the United States Joint Space Operations Center, the United Kingdom Space Operations Coordination Centre and the German Space Situational Awareness Centre who could potentially aid the gathering and dissemination of SSA. Successfully accomplishing this task requires efforts both in and out of the theatre. Within the theatre, the SCA must understand what issues users are encountering and gain the insight required to diagnose problems. Outside the theatre the SCA must gain awareness of provider activities and make sure providers have the information they need to support operations. In addition, the need to understand adversary space activities should result in specific tasking of the intelligence directorate.

Requesting Space Inputs from the JTF Staff and Components During Planning

As with most services the desired effect and not the specific system should be requested. The way to get the best response to a request for support is to let the experts figure out how to provide it based on the need. The better defined the requirement, the better the space operators will be able to determine how and if they can help meet the need.

Space requires the consideration of specific factors just like any other tool that might be used to conduct a mission. These are addressed in the Comprehensive Operational Planning Directive.⁸ Understanding how geography, meteorological factors, demographics and the electromagnetic and cyberspace environments affect operations could lead the SCA towards, or away, from space-based services. Among other factors, the SCA might try to understand: the impact of terrain masking on GPS or SATCOM; the availability of models which can predict the impacts to communications based on solar activity or heavy precipitation; the potential for unintentional interference between friendly forces; and the possibility that the adversary has tried to discover these same facts for themselves and can use them against the JTF.

Ensuring Optimum Interoperability of Space Assets with Allied/Coalition Forces

Interoperability between space and terrestrial forces starts by recognising the inherent advantages and disadvantages of operating in the different domains. Commanders do not like constraints, but orbital mechanics dictate certain rules they must follow if they want to make use of space capabilities. As a rule of thumb, planning should start with the availability of

“The way to get the best response to a request for support is to let the experts figure out how to provide it based on the need. The better defined the requirement, the better the space operators will be able to determine how and if they can help meet the need.”

space assets because, by and large, they are less flexible than their terrestrial counterparts. A commander could sequence an operation to take specific advantage of a low earth orbit overflight, but it is currently unlikely that the satellite can or will be manoeuvred so that it can meet the commander’s time schedule. This offers opportunities and challenges and requires awareness of the specific situation. For example, given a task to conduct routine monitoring of reconstruction efforts a component may naturally select an organic asset such as a remotely piloted aircraft (RPA). Leaving aside the space dependencies of the RPA, using it in this fashion means it won’t be available for another, perhaps more important, task. An alternative

could be to use optical satellites to routinely collect against these kinds of static requirements to allow the commander to exploit the flexibility of the RPA in dynamic operations.

Recommending JTF Military Space Requirement Priorities to the JFC

The nature of many of today’s space capabilities means that on most occasions component commanders will not need to compete for specific space resources. When they do, prioritisation ought to take into account the considerations detailed above. The key from the JFC perspective should be diagnosing whose use of space best contributes to the mission at that time.

The operational art of space employment is only just emerging. Practical tools and processes, coupled with the mental agility of commanders and planners could lead to previously unforeseen opportunities. Conversely, failing to consider the implications of space dependence could open a successful avenue of attack for an adversary. Military professionals are undoubtedly exploring the boundaries of space service opportunity and vulnerability. The question we should ask is: are they friend or foe? ●

1. Warden, John A. III, *The Air Campaign*, Excel Press, 2000. Pg xiv.
2. Allied Joint Doctrine for Air and Space Operations, November 2009, page 6–2.
3. *IBID*.
4. Ehredt, Dave. ‘Command and Control—Exploring Alternatives: The Realities of Two C2 Models for Air Power Proponents’ *The Journal of the JAPCC*, Edition 14, 2011. (www.japcc.org)
5. http://www.nato.int/cps/en/natolive/news_76776.htm?selectedLocale=en
6. Allied Joint Doctrine for Air and Space Operations, November 2009, page 6–4.
7. *IBID*, page 6–3.
8. Allied Command Operations Comprehensive Planning Directive V1.0, December 2010, page 4–36.



Major Phil Verroco

entered the Air Force in 1999. He began his career as an Intercontinental Ballistic Missile operator before attending the U.S. Air Force Weapons School in 2004. Following graduation he was posted to Schriever AF Base, Colorado, as the Chief of Weapons and Tactics and subsequently became the Headquarters Air Force Space Command Chief of Tactics. He has deployed as the AF Central Command Chief of the Combined Air Operations Centre Combat Operations Division space cell and participated in an array of exercises in many strategic and combatant commands. Major Verroco most recently held the position of Chief of Space Policy, Joint NATO Strategist at the Joint Air Power Competence Centre in Kalkar, Germany.



The Czech SA-6 Gainful in a staging area and Ready-To-Move (RTM).

Avoiding the GBAD Gap

The Czech Approach

By Colonel Josef Slavik, Director, Czech Air Force Department of General Staff

The Czech approach for avoiding the gap in Ground Based Air Defence (GBAD) follows the thought that giving up existing capabilities due to financial constraints is not a prudent option, because it would result in a much higher payment requirement in the future when it is required to rebuild those capabilities. Maintaining or modernising current capabilities, supported by military industry cooperation on a national or international level, can positively affect budgets and would fit the Smart Defence approach of NATO.

Background

Since 1990 the Czech Republic has observed a fundamental change in its security environment, including: the disintegration of the Warsaw Pact, integration into NATO, 9/11 terrorist attack, and increased focus towards missions abroad (Military Operations Other Than War, MOOTW). Each of these milestones had a tremendous impact on how our operational analysts and military leaders see the role of Air Defence in the

future. Air Defence of Czech territory was designed on three pillars: Czech Air Force capabilities, GBAD capabilities and effective command and control (C2). When looking at air capabilities today, our focus leans toward flying services rather than GBAD. In this environment it is obvious the role of Quick Reaction Alert (QRA) is essential during peacetime Air Defence. The question concerns the new role of GBAD within the Air Defence mission. How might the GBAD force take part in the Air Defence of NATO territory? These are important questions which need to be answered in order to prepare the Czech Air Force, as a whole, for the future.

Historical Aspects

The Czech Republic has always paid great attention to the protection of its airspace and deployed units. Almost every Army and Air unit had GBAD capabilities within their organisational structure. Continuous tactical evaluation of GBAD units was an inseparable part of the tactical and operational assessment of Air Force

and Army divisions or corps. The Czech Republic had a robust air defence system during the Warsaw Pact time in order to defend the western border. The whole system had to fulfil tough requirements with surveillance coverage up to 200 km beyond Czech borders. This was achieved by the development of a robust system of stationary and mobile radars and observation posts. Of course the whole system was built based on Soviet doctrine and was part of the Warsaw Pact Air Defence system.

After 1991 the Czech military leadership had to find a new concept matching completely different security environments. This made the 1990's a challenging era of various experiments and emerging concepts. The decision at NATO's Madrid summit in 1996 to invite the Czech Republic as a member provided the political and military leadership a clear direction on how to protect Czech airspace and maintain its own sovereignty.

Since 1999, when the Czech Republic became a NATO member, the main focus shifted to become part of the NATO Command Structure and its Integrated Air Defence System (NATINADS). The main question which had to be answered was if the Czech Republic should buy new western equipment that followed NATO standards or if integration should be done with the mainly Russian built systems? For the Air Force pillar of Czech Air Defence the first option was chosen; procurement of the new supersonic aircraft JAS39 GRIPEN. For the C2 system it was decided to integrate the already existing Czech command and control system 'SEKTOR' into the NATINADS C2 structure.

Concerning GBAD forces the Czech general staff decided modernisation of the 2K12 KUB (SA-6) as the best approach for the medium range GBAD system. The main objectives of the modernisation were to upgrade the tactical parameters of the system, fulfil NATO standards and to enable the SA-6 for joint deployment within a GBAD Cluster Concept. This modernisation project would allow the SA-6 to stay operational until 2015, at which time a new GBAD system was foreseen. For Short Range Air Defence (SHORAD) capabilities it was decided to procure the new Swedish RBS 70 system.

Operational Aspects

When evaluating operational aspects of GBAD it is important to take into consideration that GBAD forces will always operate in a very dynamic and rapidly changing operational environment. This puts military planners under pressure to predict future scenarios. Hence the name of an AIRNORTH seminar dealing with future challenges to the NATO Alliance: CRYSTAL BALL.

The main mission for GBAD remains the protection of civilian population and vital infrastructure from air attack. One of the biggest lessons learned from 9/11 is that loss of civilian lives in western civilisation provides a fundamental centre of gravity for our enemy. The protection of our own forces during deployment is equally important. It is obvious that, the Czech Armed Forces face multiple challenges to define a clear and unambiguous role for GBAD. Many NATO nations and partners face these same challenges.

Czech Approach to GBAD

As mentioned earlier, the Czech Ministry of Defence (MOD) decided to modernise the medium GBAD SA-6 system launching the project in close cooperation with the Czech defence industry. The main goal was to reach NATO interoperability standards, integration of the western Identification Friend or Foe (IFF) system and electromagnetic compatibility with the European frequency table.

It was obvious that modernisation of the SA-6, due to lifetime of the missiles, would only be a short term solution. The project was completed successfully in 2008 with live-fire in Poland. With NATO exercise ELITE 2008, an even more important milestone for SA-6 modernisation occurred with the participation of 25th GBAD brigade. This brought the Czech GBAD Forces into the NATO GBAD family as a full partner.

This modernisation of the SA-6 satisfied requirements, plus offered additional benefits in extending its life, increased operational effectiveness and manpower reduction as fewer operators are required. Commander of the Joint Forces, Major General Halaška, described the result of the modernisation

after live-fire testing as follows: “Today you have brought the Air Defence brigade ahead 30 years. You have stridden from the analogue to the digital age. You have received a fully fit, digitised SAM system, enhanced by new functions with a substantial level of higher combat parameters.”

The question continued with what could be done beyond this term, in a country with a relatively small economy? This situation led to three possible courses of action:

1. Development of own capabilities by procurement of a completely new system. This seems only possible to a limited degree and in close specialisation. The focus on procurement of all Air Defence systems categories is not possible in regards to the economic situation.
2. Abandon the capability, while facing the high level of risk associated with reducing GBAD capabilities and development of new air assault assets. In the case of a future need for the abandoned capability, significant problems like specialists training and re-gaining of capabilities in very short time must be accepted.
3. Maintain current capabilities based on economically reasonable and acceptable solutions. For example, it is possible to conduct system modernisation, which answers operational requirements of potential future mission profiles.

The Czech MOD decided on the third option. New budget restrictions forced the Czech military leadership to continue discussing the future of GBAD. The Czech Defence budget did not allow procurement of a new GBAD system. The logical approach was to find an alternative solution. This resulted in approaching industry in 2009 to offer such a solution.

Manufacturer RETIA offered complex modernisation of the launcher (crewless operation) and replacement of the obsolete Russian missiles 3M9. In 2009 a research and development project was launched to integrate the missile ASPIDE. This task was carried out by a joint integrated team consisting of subject matter experts from the University of Defence of the Czech Republic, the General Staff and industry, represented by RETIA and MBDA.

Intricate adjustments of a whole system will bring many benefits, especially in air defence, of areas and assets against a larger spectrum of the enemy’s air assault assets. The modernisation significantly affects all system elements and solves the problem of capabilities, maintenance of all indispensable parts of GBAD, airspace surveillance, command and control, active and passive air defence for the Czech Republic. By modernisation, armed forces are proficient to act in a new operational environment, with improved combat capabilities and have saved funds compared to procurement of a new system in tough economic times.

A conclusion can be drawn that there is an economically viable way to maintain current capabilities while meeting requirements to modernise GBAD systems. However, successful achievement requires close cooperation between military and defence industry experts. In addition, multinational cooperation within NATO SA-6 community might be very useful and align with the concept of smart defence.

Smart Defence in Terms of Modernisation

Today the situation within the international SA-6 community is almost identical. Slovakia, Hungary, Romania and Bulgaria are also facing the same challenges:



The SA-6 is a tactical air defence missile system designed to attack aircraft, cruise missiles and attack helicopters.

© Jiri Kouba, CZE MOD

either modernise GBAD systems or completely give up GBAD capabilities. Downgrading the capability is not an option. Each country must decide how it will protect its own airspace along with NATO's. We can still observe independent efforts by each country to find a national solution.

The Smart Defence approach might be the guide to reach a common goal and save resources. Many planners see Smart Defence suitable for procurement of entirely new systems or capabilities. The same approach, however, could be used for modernisation projects and maintaining present capabilities. Training forces also falls under the Smart Defence approach.

Trained personnel are a key for success in any military operation. To have professional staff training in place is a significant aspect of a nation's GBAD capabilities development. Failing here can easily lead to unfavourable conditions or even unintended loss of life. Enabling the complex weapon systems to succeed in battle against sophisticated and a tactically savvy enemy requires permanent and effective training of operators and decision makers. Even more so, methods of warfare as of a few years ago seemed like science fiction. Today it is a reality. New technology and less manpower on the system requires new modern, which also mean more expensive, training facilities. Simulation is important requirement for effective, and in this case, less costly training.

Recent thoughts in this area hint that outsourcing or multinational cooperation of SA-6 crews training after modernisation might be the right approach. With regard to the expected life cycle of a modernised SA-6,

20 years of service is not enough to ensure a return of investment for training systems and facilities. It is obvious the decision concerning the definition of training modules remains with the armed forces. When the right relationship between user and supplier is defined, it is possible to maintain appropriate levels of skilled personnel. Also another aspect is the availability of systems, well known by soldiers. This will lead to substantially lower economic burden during crew upgrade. In the area of specialists training the positive effect can be reached in the case of SA-6 modernisation. Crews will not be forced to deal with a completely new system but will need to be trained in using modernised elements.

Conclusion

For the GBAD systems 2K12 KUB, the next logical step would be to bring military planners and (national) industries to one table in order to find the best solution for air defence. Implementation of a military capability development process is important for every NATO nation. For small countries with limited resources, like the Czech Republic, it is crucial. Participation in multinational operations such as in Afghanistan, Bosnia-Herzegovina or Kosovo, remains a high priority. Any deployment, regardless of the force, requires the correct response to new emerging operational demands. In addition, sovereign countries, such as the Czech Republic, cannot give up their constitutional responsibility to protect its own airspace. The most efficient way to maintain GBAD capabilities is to ponder the capabilities of serviced GBAD systems against its potential for future modernisation. With that in mind, cooperation between the military, academia and worldwide industry is the key to success. ●

Colonel Josef Slavik

joined the Czech Air Force in 1975 and graduated from the Military University in Liptovsky Mikulas in 1979. He served in many technical, staff and commanding positions within Air Defence of the Czech Republic. Col Slavik graduated from the Course for Senior Air Defence Officers, USA, in 2001 and from the Czech General Staff Course in 2005. He was promoted to Colonel in 2005 and became Commander of 25th Air Defence Brigade at Strakonice. In 2010 he was promoted to his current position of Director of the Air Forces Department of General Staff.



Hybrid Warfare

Air Power and the Narrative

By Major Önder Şahan, TUR AF, JAPCC

Introduction

Historically, Air Power practitioners tend to focus predominantly on the kinetic side of Air Power. In preparing for conventional wars, this approach may be understandable. However the conflicts of today include a mixture of conventional and non-conventional threats, becoming the so-called Hybrid Warfare. You cannot succeed in these types of conflicts by conventional means alone.

Further, with images moving around the globe at the speed of light simply striking the target doesn't necessarily signal success. The power of the narrative is such that legitimate uses of Air Power yielding tactical success can result in strategic failure placing victory at risk.

In order to determine the most effective employment of Air Power in Hybrid Warfare, this article looks first of all at the Hybrid War environment and how Air Power should be defined in this context. The use of Air Power in these types of wars is then discussed by reference to a number of historical examples. Finally, the most effective employment of Air Power in Hybrid Warfare is proposed.

Hybrid Warfare

Hybrid threats are those posed by adversaries, with the ability to simultaneously employ conventional and non-conventional means adaptively in pursuit of their objectives.¹ Adversaries may include states, rogue states, non-state actors or terrorist organisations that may employ a combination of actions in an increasingly unconstrained operating environment in order to achieve their aims.



Light attack aircraft could play a larger role in future hybrid wars.

In particular, when the non-conventional part of Hybrid War is being discussed, conflict zones rarely consist only of states with territories that are comparatively large and borders that are clearly defined. They don't consist of regular, state owned armed forces but of militias, guerrillas, and terrorists operating in a decentralised manner; where combat takes place in close terrain, such as in jungles or mountains, and where the belligerents mix with the surrounding civilian population so that friend and foe are virtually indistinguishable. Under such circumstances some commentators have suggested that the Hybrid War environment does not offer the conditions for the most effective employment of Air Power.² However this judgement might be because those commentators are overly focused on the kinetic aspects of Air Power and so may be overlooking opportunities.

“Using Air Power irresponsibly may result in failing to achieve the stated political strategic aims and objectives. We also have to consider the impact of the narrative on our own public opinion ...”

In these kinds of conflicts our adversaries are often adept in their use of the media and internet to skew the results of Air Operations, spreading disinformation, conspiracy and even truthful but unflattering information all over the world. Air Power practitioners need a more open debate about the value of hitting military targets which, directly or indirectly, affect the civilian population. To put it bluntly, can it ever be effective to ‘punish’ the civilian population? And if punishment is not the intent, how do you balance the long-term strategic effects of collateral damage against short-term tactical advantage? In other words, are there more effective ways to succeed in Hybrid Wars than causing the death of many civilians and destruction of a country?

Air and Space Power can be defined³ as “the capability to project power from the air and space in order to influence the behaviour of people or the course of events”. This description of Air and Space Power is particularly appropriate in the context of Hybrid Wars.

Projecting power from the air and space is not only about kinetic air operations. Often, however, this is still the main focus.

Hybrid Wars Past and Present

Wars such as Operation Enduring Freedom (OEF) in Afghanistan, the Vietnam War, the France-Algeria War and the 2006 Israel-Hezbollah War demonstrate and justify the need for a clear transition from conventional thinking. In these wars Air Power delivered what the planners required. However in the application of force against hybrid threats an old-fashioned and conventional strategy of using Air Power in a destructive way was pursued. This situation was sometimes driven by the limited range of capabilities available or by focusing the strategy primarily around the kinetic effects of Air Power.

In Hybrid War, the narrative usually employed by our adversaries is not only that civilians are hit while only a few of their fighters are killed, but also that they are able to survive the best that we can throw at them. Since they live among the civilians they are able to win the hearts and minds of many. Sometimes our adversaries are strengthened politically despite their ‘conventional’ defeat by Air Power. So we have to revisit our Air Power approach to Hybrid Warfare in which we spend a lot of money while our adversaries hide or even grow more powerful in some cases.

Here are typical examples of this point. Two from the more distant past and two more recently:

“As the French war in Algeria (1954–1962) progressed, the primary role of the French AF, Armée de l’Air, became offensive. B-26s bombed villages, destroyed schools and killed civilians in the market place. This had the effect of bolstering Algerian support for the National Liberation Front instead of reducing it. In the end, the French scored a military victory but did not achieve the desired political end state. The war lost support on the home front, hurt the economy, and tore the political fabric of the nation apart.”⁴

“Operation Ranch Hand, one of the Vietnam War’s longest air campaigns involved the use of unconventional weapons, including defoliants, napalm and



© U.S. Air Force, Lt Col Leslie Pratt

An MQ-1 Predator, armed with AGM-114 Hellfire missiles, flies a combat mission over southern Afghanistan.

gases in South Vietnam from 1961 until 1971. Trying to coerce the National Liberation Front through defoliation and crop destruction resulted in the unintended, although anticipated, consequence of reducing support from South Vietnamese themselves.”⁵

A more recent example of the point is made by the failure of Air Power in the 2006 Israel-Hezbollah war. William M. Arkin argues that “though Hezbollah never defeated Israel on the battlefield, because of Israel’s destructive campaign waged against the people and the nation of Lebanon, Hezbollah was able to win the hearts and minds of many. Despite the accomplishments of the Israeli Air Force, Israel’s objectives were not achieved. The kidnapped Israeli soldiers were neither rescued nor released; Hezbollah rocket fire was never suppressed, not even its long-range fire; and the extent of Israeli attacks evoked widespread condemnation. Hezbollah labelled its endurance and survival in the face of Israeli attack a ‘Divine Victory’ stating that it is rearming and more powerful than ever both militarily and politically in Lebanese internal politics and in the overall Arab world.”⁶

Some observations related to the current war in Afghanistan are that collateral damage drove officials crazy because of the public demonstrations and anger that such incidents generated toward coalition

forces. For every civilian killed, it was estimated that 10 insurgents were recruited and a recently translated Taliban insurgency manual makes clear that insurgents use collateral damage and civilian casualties to their advantage.⁷

What Should Air Power’s Role Be in Hybrid Wars?

Using Air Power irresponsibly may result in losing political strategic aims and objectives. Though Air Power is not unique in this regard the narrative related to Air Power tends to make it stand-out as especially unfair, which benefits the adversary. This prompted US General McChrystal related to war in Afghanistan to state “Air power contains the seeds of our own destruction if we do not use it responsibly.”⁸ What is meant by using Air Power responsibly? First of all the effects of bombs delivered need to be understood by all Air Power practitioners; second the ratio of military value of the target to the effect on civilian life of that target must be assessed carefully; and last when employing Air Power offensively, the kinetic effect of Air Power needs to be delivered ever more accurately. Furthermore, experience shows that in the Battle of the Narrative, there is a need for restraint even when Rules of Engagement or self-defence allows for kinetic action.

Air Power can offer close air support, intelligence, electronic warfare, and increased mobility, surveillance, and space control assets in Hybrid Warfare. Air Power's unique psychological advantage in communicating superiority to insurgent forces should be used. Air Power's flexibility and response speed remains critical and cannot be replaced by ground forces. These are some of the big advantages of Air Power compared to a manpower intensive ground force whose presence may (perhaps unintentionally) antagonise the host nation population.

Air Forces need better information/knowledge management in order to gain supremacy in a hybrid operational environment. A C4ISTAR architecture which consists of Reconnaissance and Surveillance Satellites, AWACS, UAVs, Electro Optic and SAR capable pods is needed for an effective C2 structure. Many Air Power capabilities are unique and have distinctive qualities such that, through innovative use, an asymmetric effect can also be achieved by friendly forces.

Conclusion

Wars are neither games nor sporting matches. Although casualties do matter, wars are not judged in terms of the number of points gained or lost. Instead, war is the continuation of politics by other means.⁹ This point of view obliges us to plan wars, prepare them, wage them and judge them by the political effect which they have on the international and national system.¹⁰ Using Air Power irresponsibly may result in failing to achieve the stated political strategic aims and objectives. We also have to consider the

impact of the narrative on our own public opinion which is the key to winning. A public that wants to stop fighting will eventually force its government to do so even if the outcome is against the national interest in the opinion of its leaders.

“Hybrid threats are those posed by adversaries, with the ability to simultaneously employ conventional and non-conventional means adaptively in pursuit of their objectives.”

As stated, Hybrid Wars are a mixture of conventional and non-conventional conflicts. Since the predictability of future wars is limited, Air Forces, while being ready for the conventional part of future conflicts, also need to prepare for non-conventional conflicts. A balance in force structure is needed to counter both conventional and non-conventional conflicts of the future and to win the narrative as well as the war. ●

1. NATO Capstone Concept for the Military Contribution to Countering Hybrid Threats, Final Draft Version, Chapter 1, 2010.
2. Luciano Bozzo, University of Florence, Department of Political Science and the Sociology of Politics, 'Airpower in International Politics: An Academic Perspective', Pg 5, 2011.
3. British Air and Space Power Doctrine, Air Publication (AP) 3000, 4th ed.
4. Almir Suman de Azevedo (Retired Brazilian Pilot), Presentation in 'Air Power in Irregular Warfare Conference'.
5. Evelyn Krache Morris, 'Techniques and Gadgets, Hearts and Minds: An Analysis of Operation Ranch Hand', from the book 'Air Power, Insurgency and the War on Terror' Edited by Joel Hayward, Published and distributed by Royal Air Force College, UK, 2009.
6. William M. Arkin, 'Divining Victory Airpower in the 2006 Israel-Hezbollah War' by Air University Press Maxwell Air Force Base, Alabama, August 2007.
7. Conference Report of 'Air and Land Power in Counterinsurgency Operations: Implications of a Civilian Center of Gravity' September 6-7, 2007.
8. 'US commander in Afghanistan to order limits on air strikes' The Guardian, June 22nd, 2009.
9. C. von Clausewitz, on War, M. Howard and P. Paret, eds., (Princeton University Press, 1976), 87.
10. Martin van Creveld, New Era Security, The RAAF in the Next 25 Years, Air Power 2025.



Major Önder Şahan

graduated from the Turkish Air Force Academy in 1999 with a Bachelor's Degree in Science as an Aeronautical Engineer. He was selected to get a master's degree at the US Air Force Institute of Technology. After serving in the TurAF Headquarters, he was chosen to attend the Air War College where he received his second master's degree in International Affairs.

Major Önder Şahan is currently in the Joint Air Power Competence Centre as a Policy, Doctrine & Integration Officer. He took part in developing the draft NATO Concept for Countering Hybrid Warfare.

Joint Air & Space Power Conference

09th – 11th
October
2012

Warfare in the 21st Century Decline or Rise of Air Power?

Register Now!

Registration form available online
at www.japcc.org



Joint Air Power
Competence Centre

A Note From the JAPCC Editor

A warm welcome to all our readers and a special thanks to our newly posted JAPCC Executive Director Lt Gen Joachim Wundrak for his editorial and highlighting some of the various exciting transformational articles submitted for this edition. General Wundrak is coming to us from his position as the Deputy Commander, German Air Force Command and has served in operations as Deputy Chief of Staff, Air ISAF. The JAPCC Journal team is elated to have his guidance.

I would like to say a big thank you to all who contributed to our online survey enabling us to find out more about the opinions, views and reading habits of our audience. This snapshot of readers' views, and the findings were very favourable and will help us in our quest to further shape the direction of the Journal as we go forward. We will continue with our survey and hope that even more readers will complete it at:

<https://www.surveymonkey.com/s/JAPCC>



© JAPCC, Sgt1 Lillian Brandon

Alessio Cecchetti, Brigadier General, ITAF
Assistant Director Capabilities

Finally, my congratulations to the winners of the book draw prize. Four names were selected at random from those who completed the online survey and each will receive the books reviewed in a previous Journal.

Thank you for your continuing support. ●

European Air Transport Training 2012 (EATT 12)

Sponsored by the European Defence Agency (EDA) and in close coordination with the European Air Transport Command (EATC), the first European Air Transport Training (EATT) exercise took place 4–15 June 2012 at Zaragoza Air Base, Spain. EATT is a Pooling & Sharing block training event aiming at enhancing interoperability and tactical awareness between tactical airlift (C-130, C-160, C-295 ...) users in the area of operations and training by starting to work out standardised procedures. In all, 6 nations (Belgium, the Netherlands, Spain, France, Germany, and the Czech

Republic) participated with 8 aircraft and 14 crews. Additionally, Sweden, Greece, Italy and Bulgaria participated with observers and the US supported the event with several Advanced Airlift Tactics Training Course (AATTC) instructors. All participants agreed it was valuable multinational training that exceeded their expectations.

JAPCC Combat Support Branch subject matter experts delivered presentations on Air Transport and Personnel Recovery, with the purpose of providing a

broad overview of related NATO doctrine and procedures available to help optimise resources and preserve interoperability and standardisation within EU/NATO country Air Forces. The EDA's ultimate goal is to establish a permanent European AATTC (based on the existing US course) with initial operating capability in 2014 and full operating capability by 2019, aiming at more cost efficient airlift training in Europe. JAPCC involvement will help support the future Academics portion of the EAATTC as well as gain lessons identified and feedback to help improve related NATO doctrine.

Overall the EATT 2012 was deemed a great success and planning for EATT 2013 has already begun within the framework of the European Air Transport Fleet (EATF) partnership. EATT 2012 lessons identified will

be used to improve EATT 2013 in addition to forming a solid basis for future European operations, in the perspective of the use of the A400M and in the setup of EAATTC. ●



© Armée de l'air, R. Nicolas-Nelson

Shriever Wargame

At the formal request of the JAPCC Director, General Mark A. Welsh III, to the Commander, US Air Force Space Command, NATO participated in the Shriever Wargame in April 2012. This was the first time NATO has participated in the event that focused on the employment of space and cyber warfare in a future conflict. The JAPCC worked extensively with the

Schriever team, SHAPE and JFC Brunssum to integrate NATO. Consequently, nine NATO nations and Australia 'battled' a combination of terrorists, pirates and affiliated third parties during the world's premier space and cyberspace wargame, at the US Air Force Warfare Center at Nellis Air Force Base in Nevada.

Set in 2023, the Shriever Wargame 2012 offered NATO an unprecedented opportunity to explore combined space operations. All NATO activities were based on a pre-developed Space Operations annex to the JFC OPLAN following the Comprehensive Operations Planning Directive. Within this OPLAN, COMJFC specifically intended to integrate and synchronise terrestrial operations with space-based capabilities made available for mission execution. The game planners enabled the most difficult aspects of combined space operations; the sharing and orchestration of processes

and personnel. This resulted in invaluable operational benefits and insights of the requirement for Space Operations in NATO.

At the conclusion of the JAPCC's involvement with the Shriever Wargame 2012, NATO sees some of the short term benefits as enhanced space awareness in NATO, increased national demand for the development of space expertise for NATO operations and expanding NATO space training. ●



JAPCC Improvement Campaign: Strategic Cooperation with EUMS

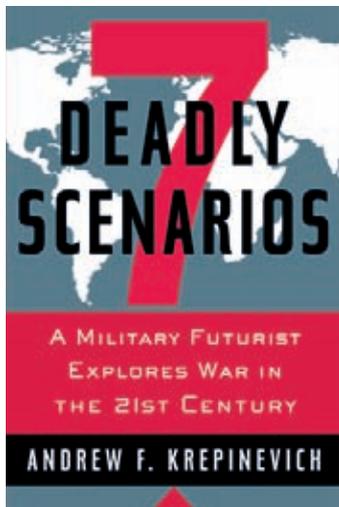
In line with the JAPCC Improvement campaign, and driven by the NATO/EU cooperation to enhance strategic cooperation with the EU, the JAPCC visited the European Union Military Staff (EUMS) in order to discuss areas of mutual cooperation. This first time visit by the JAPCC delegation was headed by the JAPCC Assistant Director Capabilities, Brigadier General Alessio Cecchetti (ITA) and hosted by the EUMS Director of the Concepts and Capabilities Directorate, Brigadier General Pascal Roux (FRA).

Briefings related to missions and tasks of both organisations were given in areas of mutual interests with the potential of further cooperation. As a result, an agreement to assess the respective programs of work in more detail was made. A follow up of discussion is

forthcoming to detail projects of mutual interest on a strategic level. The JAPCC has assessed that the experience of the European Union and lessons learned from their comprehensive operations could be of pivotal relevance to the mission of the JAPCC in providing timely advice and subject matter expertise to the alliance and its participating nations both proactively and responsively.

Recognising, that the European Defence Agency (EDA) together with the EU Concept and Capability Directorate are providing the EU 'Transformation Tool' in the general understanding of combined and joint military and civil cooperation for all missions conducted by the EU, the JAPCC decided to enhance the established cooperation with the EDA. ●

‘7 Deadly Scenarios: A Military Futurist Explores War in the 21st Century’



By Andrew F. Krepinevich
Bantam Books, A Division of
Random House, Inc., New York, 2009

Reviewed by:
Lt Col Ralf Korus, DEU L, JAPCC

Although written in 2009, ‘7 Deadly Scenarios’ by Andrew F. Krepinevich remains just as relevant today. The author describes various scenarios which at first glimpse seem to be a bit futuristic, but are they?

Is a nuclear armed Pakistan a stable country? Could terrorists get their hands on nuclear materiel? Are we able to contain pandemics in a globalised world? Is the Iranian nuclear programme seriously civil? Is China willing to stay in the second row and so on?

The author’s auditorium is the US military and politicians who he say are all, more or less, unprepared to deal with these types of future challenges. He argues that everybody is still fighting ‘old wars’ instead of anticipating new ones, drawing comparisons to the surprise at Pearl Harbour and the 9/11 attacks. From a European perspective these challenges will not only be faced by the US, but will have an impact on all governments.

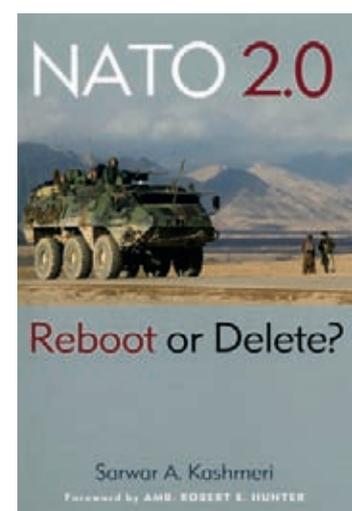
He concludes that innovation and transformation, both militarily and politically, is the best way to deal with the unthinkable. Better education, training and planning as well as better use of resources at all levels and developing future requirements are the key – but now and not tomorrow. Already we see this type of strategic change with the US refocusing its attention to Southeast Asia, where several of these book scenarios play out.

Overall, I highly recommend this book to you as an interesting read that will make you think about seemingly futuristic scenarios, which are entirely plausible outcomes today. ●

‘NATO 2.0: Reboot or Delete?’

It’s widely accepted that NATO currently operates outside of its original purpose and scope, having shifted its focus to various out-of-area operations since the end of the Cold War. NATO Transformation efforts however, have had questionable success. ‘NATO 2.0: Reboot or Delete?’ by Sarwar A. Kashmeri confirms this belief, offering both an inside look and an independent assessment of NATO, which is both thought-provoking and controversial. The book is deeply critical of the NATO bureaucracy while recognising its past importance and arguing for its continued existence but in a reduced role.

Kashmeri argues for shifting the responsibility for European defence to the European Union who he says carries greater “diplomatic clout on the world stage” and is better positioned for future operations as military budgets shrink and European militaries increase their defence sharing and coordination. NATO could then be freed up to become an agile, nimble and flexible “mechanism to enable the EU, the US, and Canada to act together, if that should ever become necessary again”. Kashmeri recognises several obstacles to such an idea and offers concrete solutions, as well as some wishful thinking, on how to overcome these. That said, ‘NATO 2.0: Reboot or Delete?’ is, to date, the most complete critical analysis of modern day NATO and a fascinating read for both military folks and politicians, regardless of what one currently thinks of NATO. ●



By Sarwar A. Kashmeri
Potomac Books, Inc., Virginia, 2011

Reviewed by:
Lt Col Roger Efraimsen, USA AF, JAPCC



***THE VALUE OF
UNITING AS A
GLOBAL TEAM TO
DELIVER NATO'S NEW
JOINT ISR CAPABILITY.***

NATO's new Alliance Ground Surveillance system brings together the best of European and American technologies to answer the pressing need for joint Intelligence, Surveillance and Reconnaissance. No matter the mission or where in the world our NATO forces are called, AGS will serve as an enabling capability to support a 21st Century Smart Defence. Northrop Grumman and all of its industrial partners are proud to be a part of this new era in cooperative international security.

THE VALUE OF PERFORMANCE.

NORTHROP GRUMMAN