Transforming Joint Air Power
The Journal of the JAPCC

Edition 6

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Editorial

Air power is indivisible. If you split it up into compartments, you merely pull it to pieces and destroy its greatest asset, its flexibility.

Field Marshal Montgomery

In a journal based around the theme of the upcoming JAPCC Conference – The Role of Air Power in Expeditionary Security and Stability Operations – it is perhaps timely to reflect on Field Marshal Montgomery's view over half a century ago. Notwithstanding the land-centricity of contemporary operations, it is what Air (and Space) offers as a whole that has the potential to make a difference, rather than the tactical attraction that 'penny packets' might provide.

This, the 6th Edition of the JAPCC Journal, covers much ground in this debate and places increasing emphasis on the need for Air to contribute to 'Effects' wherever and whenever possible with whatever means we find at our disposal. We start with a fascinating insight, direct from the frontline, on the challenges facing NATO Air in Afghanistan. We then look at a variety of subjects intrinsic to an Effects Based Approach to Operations, which demonstrates conclusively that Air's contribution goes way beyond the application of kinetic effect. From rebuilding the Iraqi Air Force, through Air's employment in Information Operations, to an historic reflection on the strategic implications of the Berlin Airlift, we build a picture of how Air can be used effectively in the widest sense. And that perhaps is the key, which is reiterated across this Edition's other articles – Airmen must constantly look to innovate and challenge established thinking in how the unique capabilities at their disposal can be brought to bear.

Elsewhere in the Journal, I am most grateful to Lt Gen de Jong for providing this Edition's Air Chief's View; in addition to providing a privileged insight into developments within the RNLAF, Lt Gen de Jong reinforces the need for Air Forces to embrace transformational change whilst delivering across the spectrum of Joint and Combined operations.

Finally, I commend to you the 'Out of the Box' article on the role of Space in today's operations. As well as raising awareness on the critical enabling capabilities that the outer reaches of the 3rd dimension provide, the article asks some telling questions of NATO policy in this area. The article also marks the opening JAPCC salvo on our theme for the coming year – the contribution of Air and Space to Battlespace Management (BSM) – where we want to explore how BSM is taken forward and the impact it will have as we transform towards a future effects based, networked enabled world.

Garfield Porter
Air Commodore, GBR AF
Assistant Director Transformation

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We encourage comments on the articles in order to promote discussion concerning Air and Space Power inside NATO's Joint Air community. All comments should be sent to articles@japcc.de

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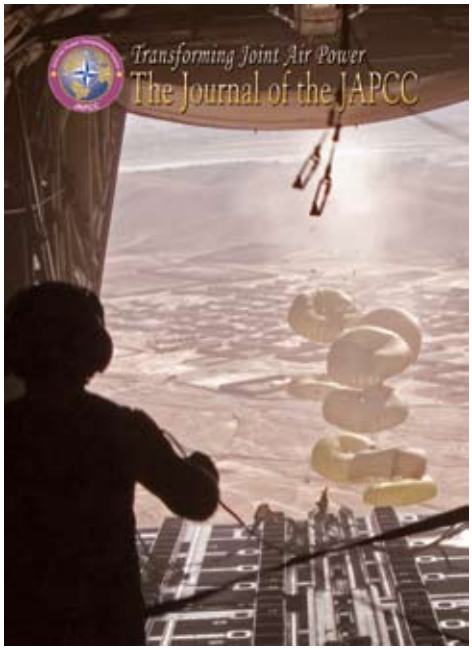

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Challenges of Air Command and Control in Expeditionary Operations

The Afghanistan experience, a personal view

By Major General F.H. Meulman, Deputy Commander Air ISAF X, NLD AF

Afghanistan 2007, 6 years after the end of a long period of suppression, the country steadily crawls out of its black hole. Afghanistan has been a country hard beaten, firstly, under the communist regime and secondly, as a result of warlordism and civil strife under the Mujahideen. Finally, it was suppressed under the Taliban regime and its fundamentalist approach towards Islam and society. This 30 years of suppression has brought this wonderful country almost to its knees. Almost, because the inherent flexibility of the people of Afghanistan, together with numerous representatives of the International Community and International Security Assistance Force (ISAF), reinvigorated a process of establishing safety, security, reconstruction and development and a new governmental framework with institutions.

Afghanistan Security & Stability

We are not there yet simply because the security and safety situation in the country does not allow for comprehensive reconstruction, development and the establishment of governmental structures with institutions at a level and speed that we, and the people of Afghanistan, would like to see happen. Furthermore, the complexity of Afghanistan is best reflected in the continuous interplay of the following factors: a weak central government disconnected from local, district and provincial developments; fragile institutions; illiteracy; narcotics; corruption; insurgents; bad infrastructure; tribalism; warlordism; criminality and the challenges that go with the geopolitical situation of Afghanistan and its neighbouring countries.

> 'Overall, ISAF and its supporting elements "deliver." They deliver because of proper planning, tasking and executing capable air forces.'

A very important precondition to overcome this complexity deals with security, and in particular, the support to the Government of Afghanistan (GOA) in establishing a stable and secure environment. It also deals with the further development of the Afghan National Security Forces (ANSF) to take on the challenges of providing safety and security in their own country. Until such time that the GOA and ANSF can cope with this responsibility,

it is ISAF that will support the Government of Afghanistan in this field. How? By applying the Armed Forces of 37 nations to address the wide array of military missions from humanitarian assistance (for example during floods) to the application of force where and when it is needed in the ongoing counterinsurgency.

An important aspect of this 'toolbox' is 'Air.' NATO and the Coalition work together in the realm of air to provide a wide array of fixed and rotary wing assets and capabilities including air transport, aerial resupply, intelligence surveillance reconnaissance (ISR), close air support (CAS) (to include show of force and show of presence) and air-to-air refuelling, etc. This can only be handled properly if the command and control (C2) chain that governs the whole process is focused, committed and bridged. Overall, ISAF and its supporting elements 'deliver.' They deliver because of proper planning, tasking and executing capable air forces. Air forces manned by professional airmen and women. This does not imply, however, that there are no challenges in the Air C2 arena. Let us focus on some of the broader headlines in this field.

Australian Forward Air Controller calls in close air support in ISAF.

Air Command & Control

ISAF's military C2 structure is rather complex, especially when it comes to Air C2. Commander ISAF (COMISAF), through the Deputy Commander Air, has delegated tactical control of theatre fixed wing air assets to the Deputy Combined Force Air Component Commander at the Combined Air Operations Centre (CAOC) in Qatar. Based on bottom-up inputs from the ground commanders, through the Regional Air Operation Coordination Centres, the Combined Joint Operations Centre at Headquarters ISAF (HQ ISAF) prioritises and forwards the Air Support Requests to the CAOC. The CAOC in Qatar supports COMISAF in planning and tasking the daily Air Task Order (ATO) and executing the ATO in direct coordination and cooperation with the Air Operations Support Centre in HQ ISAF. So far so good.

This process is very much dependant on integral planning, timely inputs of Air Support Requests and a flexible use of air through a mix of deliberately planned air operations, responsive airborne CAS and ground alert CAS. The whole process is closed through expedient reporting along the lines of Mission Reports, Joint Terminal Attack Controller reports and Battle Damage Assessment reports. Where the Air C2 chain as a whole generally supports COMISAF, there is a need for continuous focus and improvement in each of the elements of the Air C2 chain. Furthermore, it must be clear how the direction and

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American A-10 Warthog rolling in to deliver close air support to ISAF land forces.

guidance in NATO's operational plans relate to the preferred doctrinal approach of Air C2 from a CENTAF perspective.[1]

Overall, where Air Power is fast, flexible and precise, the Air C2 challenge is embedded in a complex NATO HQ composite organisation and structure. An organisation where people with different backgrounds, cultures (not least language), experience and not knowing each other very well, have to work together.

Air-Land Integration

Another important challenge is the further optimisation of air-land integration. ISAF's mission is firmly rooted in a combined-joint approach. This asks for integration of combined-joint aspects at the earliest moment possible. Much has been achieved. Air is integrated at HQ ISAF in CJ5, CJ3/5, CJ3, etc.[2] But we can still do better and much remains to be improved. Now it is time to strengthen continued interaction from the operational-strategic planning level to the level of tactical execution and vice versa. An important aspect is the synchronisation of activities, taking into account the fundamental differences in operational processes, whereby land starts from the notion of 'decentralised planning and execution,' while air uses the paradigm of 'centralised planning and decentralised execution.' Finally, it is of utmost importance to understand each others' requirements, have a solid understanding of each others' capabilities and capitalise on each others' strength. In short, use available means in the most efficient, effective and flexible way.

'... it is of utmost importance to understand each others' requirements [air-land], have a solid understanding of each others' capabilities and capitalise on each others' strengths.'

In the Afghan Area of Operations, *the* challenge is interoperability and compatibility of C2 systems. It must be noted that interoperability is to a certain extent hampered due to incompatible systems. There is a real need to overcome the availability of different systems like NATO Secret, ISAF Secret, SIPR, NIPR, CENTRIXS, etc.[3] There is a need for a coherent, unified C2 system that allows for optimised coordination, synchronisation and adequate information exchange. In the absence of Unity of Command, it is Unity of Effort that needs to be ensured. In order to achieve this, the establishment of a structural, coherent, unified C2 system for air operations is needed.

Effects Based Approach to Operations

Another challenge is the so-called Effects Based Approach to Operations. For air, this implies a so-called Strategy to Task approach. The latter might hold true, and is applicable for a traditional phased air campaign, but this is not a

'Air is integrated at HQ ISAF in CJ5, CJ3/5, CJ3 etc. But we can still do better and much remains to be improved.'

traditional air campaign. This is primarily a CAS, ISR and Air Mobility campaign in support of deliberately planned operations, preparation of the battlefield or dynamically supporting troops in contact or otherwise engaged. CAS also includes show of presence and show of force. If it comes to measuring effect, it is not too difficult to say, 'it was successful because the bomb hit the target.' It is much more difficult to answer the question, 'was the desired effect achieved and how is it measured'?

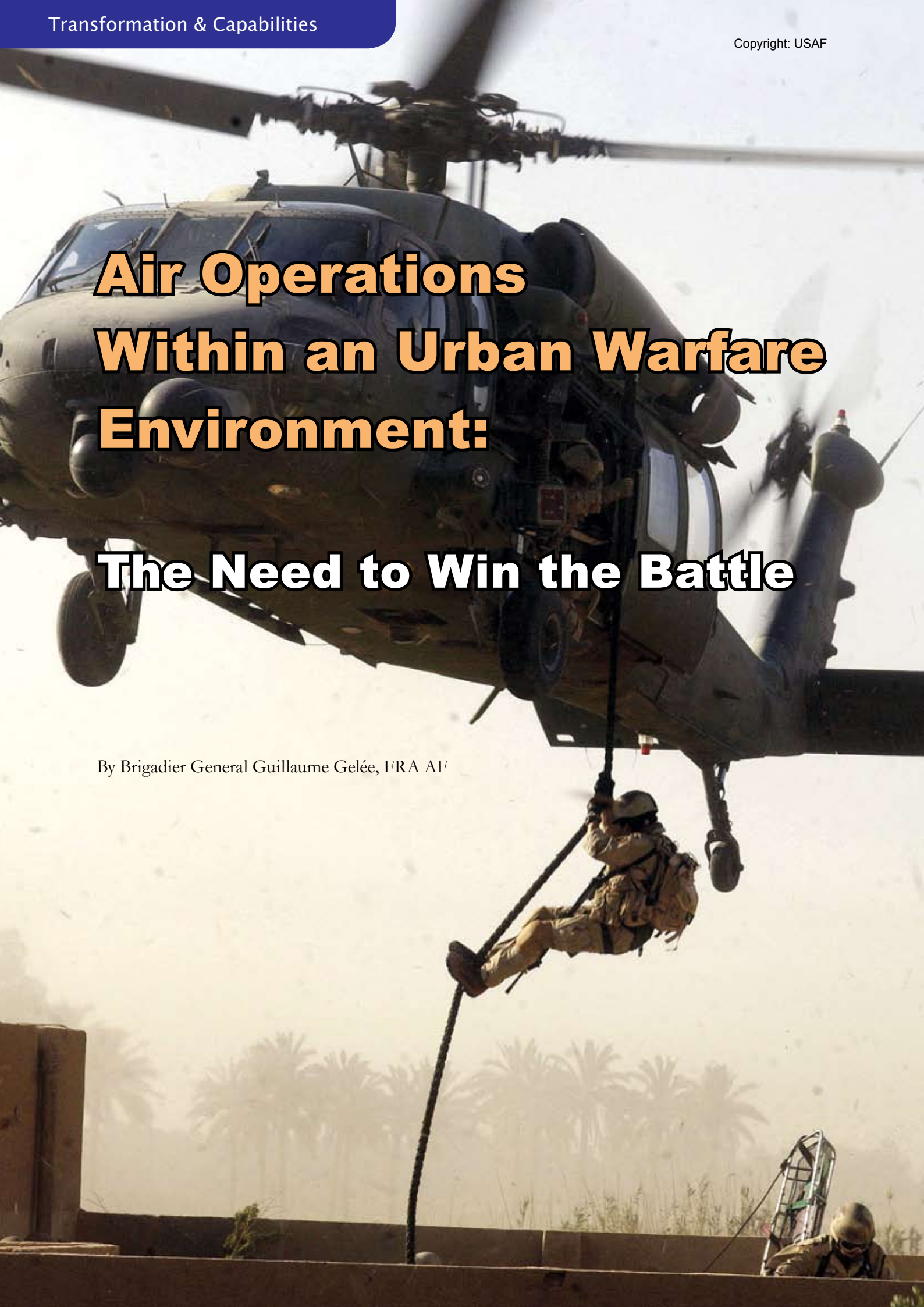
At the tactical level, the execution level, there is the ever-present need for deconfliction. For Afghanistan, there is the challenge of positive radar control. If that is not available (which is not overall the case), then there is a need for robust procedural separation. The challenge is even bigger if we take the civil use of airspace into account, especially in airspace where visual flight rules apply. Therefore, the challenge is to further optimise the radio and radar coverage over Afghanistan.

Conclusion

In this short article, I wanted to share with you some thoughts on the challenges that go with Air C2 in Afghanistan. There are many, but the bottom line is 'we deliver.' It may take the use of workarounds and acting in a flexible manner, but always as safe and professional as possible. There remains the challenge or need for further optimisation. Therefore, we should overcome national approaches and interests and work in the best interest of the men and women on the ground, who are executing their mission on a daily basis. Coalition warfare is about 'doing it together, big and small.' It may be that the biggest challenge is to Command and Control the Coalition, thereby keeping it together and focused at times when it is most needed. If we solve the basis for C2, in other words having the proper capabilities and will to unequivocally use them, then we will succeed. By doing this, we will succeed for the people of Afghanistan, the generation of today and the generation of tomorrow. ■

Endnote:

1. CENTAF is the US Air Forces within US Central Command.
2. CJ5 is Combined Joint Plans, CJ3/5 is Combined Joint Operations and Plans, and CJ3 is Combined Joint Operations.
3. SIPR is the US Secret Internet Protocol Router Network, NIPR is the Non-classified Internet Protocol Router Network, and CENTRIXS is the Combined Enterprise Regional Information Exchange System.



Air Operations Within an Urban Warfare Environment:

The Need to Win the Battle

By Brigadier General Guillaume Gelée, FRA AF

In an increasingly bipolar and asymmetric warfare world, modern armed forces are facing major questions of structure and purpose. Should they fight to protect civilian populations in overseas national disputes like Sudan or Kosovo? Should they intervene in multinational disputes like that of Lebanon? Or should they prepare to protect their own home nation against the most probable and most lethal threats, like the proliferation of weapons of mass destruction sponsored by terrorism? The ongoing budget debate continues to sharpen this focus with regard to the preparation of our future forces. Should we prepare for just the paramount types of possible future threats or should we improve our capabilities to face the real and actual crisis situations of the present?

Lessons from Afghanistan

As an actual fight against terrorism, the Afghanistan operation is probably half way between these two options. The lessons we are learning are constantly being analysed as a possible indicator for the conduct of future operations. Clearly a major point amongst them is the tendency for our terrorist enemies to move combat into urban and inhabited zones. Whatever the defence choices of the future are, it is clear that military forces must become more capable of fighting and winning an urban war.

Complex, dangerous and politically risky, urban warfare is a military challenge that can only be met through inter-agency and joint operations. To meet this challenge, Air and Space power must overcome different sets of difficulties, among which is often a lack of knowledge by the Army of the types of available air attack options and a heavy tendency for air forces to promote highly destructive weapon capabilities, with the parallel consequences of collateral damage.

Phases of Urban Operations

Theoretically, urban operations should have different phases, among which must be a preparation phase, where the decision to fight should be taken, the battle itself and, in case of success, a reconstruction phase. At the end of the day, the true sign of victory of the battle can only come from ground forces holding the ground and giving them a major role in all these types of operations. In the case of failure, all forces must share equal blame.

'Except for Special Forces who are trained to use Air Power when needed, the ground forces are not educated and trained to "think" Air Power and do not, by and large, realise the potential air attack weapon options they have available to them.'

In France, the education of Army officers is primarily focused on their own land based systems. The cooperation between different components is usually controlled by highly ranked officers. When this is added to the complex internal organization of the French Army, it becomes difficult for the different ground components to cooperate together in a rapid and co-ordinated fashion. In consequence, the joint spirit comes only after extensive liaison between infantry, armoured cavalry, artillery, helicopter, communications, etc, which could be too late to react to a rapidly changing urban warfare situation. Except for Special Forces who are trained to use Air Power when needed, ground forces are not educated and trained to 'think' Air Power and do not, by and large, realise the potential air attack weapon options available to them.

It must be noted that any official knowledge and recognition by the Army of the benefits of Air Power may be regarded as unprofitable to its own bid for the Army share of the annual defence budget. This fact, which can be applied to all three services, is certainly one of the main barriers to real joint preparations of the future.

Close Air Support

The *raison d'être* of any armed force is combat or the threat of combat. So, Close Air Support (CAS) is probably the most important feature of Air Power in urban operations. CAS has the ability to defeat an entrenched enemy positioned within buildings or behind walls that are too difficult to destroy or incapacitate using ground armament. Useful for planned operations, CAS becomes essential when platoon sized units are pinned by enemy fire with the enemy fighting in their own town knowing every street, building, corridor and underground feature. The agility of Air Power is such that a few moments after the call, decisive fire can be delivered as required to gain ground superiority.

The main shortcoming of Air Power within urban areas is collateral damage. A first analysis shows that collateral damage effects are not just due to the damage

itself but the amplification of the effect by the information channels (media). A reduction of collateral damage is entirely possible with on-going technical improvements and operational measures such as the widest possible range of weapon types, the appropriate matching of target to the power of the delivered armaments; the precision of targeting coordinates (or target description) and the precision of the weapon aiming and guidance system itself. A reduction of the effect of the information channel is not necessarily under military control but armed forces can help themselves by showing the positive effect of their presence to the population (reconstruction of water and energy networks as early as possible when the ground is safe, goods bought within the local economy) and a good relationship with the media. However, zero collateral damage combat is as relevant as zero casualty combat.

'A reduction of the effect of the information channel is not necessarily under military control but armed forces can help themselves by showing the positive effect of their presence to the population ...'

Amazingly, it is usually fighter aircraft that are depicted as generating collateral damage, despite precision guided munitions and CAS procedures, while artillery does not have such a reputation. As a comparison, during the 2006 Lebanon war, over 123,000 unguided artillery shells were fired from the northern Israeli border but there was little discussion about their collateral damage effect or where they landed. Certainly not 123,000 times on target!

The land forces need to be educated and trained to think about the joint application of Air Power.

Mirage F1CR reconnaissance aircraft provide ISR support to urban operations.

If CAS is the first reaction for air operations in urban warfare operations, other Air Power capabilities such as air superiority, intelligence and communications must be seen by all as both tactical and strategic enablers, through the safety and decision agility they provide the commander.

Gaining Air Superiority

Air superiority is often described as a necessity with which to start ground operations. In the real world, this may not be possible; for example, in a symmetrical fight against a nation equipped with modern air defence assets. If we focus our thoughts on urban warfare, it is highly probable that combat will be asymmetric. Air superiority will then be easy to gain and will help to provide Air Power, 24 hours a day, over the combat area. However, this air superiority will always be challenged by MANPADS (Man Portable Air Defence Systems). If the adversary is able to procure, even a few MANPADS, he is able to create a random threat over the entire theatre that must be taken into consideration. Depending on the level of risk accepted by the joint level, air assets may be forced to remain at medium/high altitude requiring a shift in air-launched weapon options.

In this sort of urban warfare operations, assets must fly high enough to be out of reach of MANPADS/small arms and fast enough to demonstrate agility. As shown in Afghanistan and Iraq operations, helicopters are often too vulnerable and, despite their tactical and logistical qualities, must be flown far away from high density population areas.

Intelligence Surveillance Reconnaissance

But CAS is not the only capability that can be provided by Air Power in urban warfare operations. Imagery taken from the air is the key to intelligence and intelligence is the key to the success of targeting. To prepare the combat phase, Mirage F1CR reconnaissance aircraft can map a small town in the morning and provide ground forces a fully up-to-date geo-referenced map before the end of the afternoon. More than just the view behind the wall, TV plus infrared plus radar imagery enhances the possibilities of analysis to understand the complete ground picture. Electronic intelligence allows a commander to monitor every electromagnetic transmission from enemy radios, mobile phones or modern weapon system signatures. In such an environment, the enemy is forced to hide all movements and positions during attacks, which prevents him from engaging in any large battle or concentrating massive firepower.

If the ratio between the streets' widths and the height of buildings is large enough, every movement in town can be monitored by a few assets. Supported by the appropriate network, a global and single picture is provided to all forces, which is an effective force multiplier offered to commanders.

Last but not least, Air Power supports all ground forces on time and on location with ammunition, food, water and rescue. During the Lebanon campaign in summer 2006, 95% of all wounded ground personnel where rescued by Air Power.

As in any symmetric/conventional military operation, the key to success in urban warfare operations is the appropriate co-ordination of all ground and air forces. The lack of mutual knowledge of our capabilities and attack options is our first enemy. Through a good knowledge of ground operation, Air Power will provide safety, appropriate intelligence, precise and quasi immediate firepower in all circumstances. Air Power will not win the battle alone, but it can decisively save platoon lives and accelerate the overall victory. ■

Building an Iraqi Air Force

By Group Captain Michael Leaming, RAF

We can't fight terrorists without the Iraqi Air Force and the support they give to the ground forces. If we want to depend on ourselves (to provide for our own security) we have to develop our air force capabilities.

Abdul Qadir Mohammed Jasim, Iraqi Minister of Defence

This article is based on personal experience. Between May and November 2005, I was the Air Advisor to the Head of the Iraqi Air Force (IqAF), based in the Iraqi Ministry of Defence in Baghdad with specific responsibility for advising on rebuilding the IqAF.

Background

The task at hand was to re-establish the Iraqi Armed Forces (Army, Navy, Air Force and Special Operations Forces) along Western democratic lines. This involved establishing a Ministry of Defence (MOD) with all its functions, including a Defence Minister accountable to an elected government and with civilian oversight of policy and the military budget, at the same time rebuilding the Air Force from scratch and re-equipping the Army and the Navy. In addition, we were attempting to set up a Joint Headquarters organisation *within* the MOD, whilst simultaneously rebuilding the national economy and fighting a major insurgency.

From an air force perspective, how do we start to tackle the problem?

Setting Priorities

The ultimate goal was to establish an Air Force capable of maintaining the sovereignty of Iraqi airspace, of defending Iraqi territory from external aggression, and contributing to the re-establishment of Iraq as a recognised military power within the region. In 2005, the role of maintaining the sovereignty of Iraqi airspace was carried out by Coalition Air Forces. Therefore, the Iraqis' goal was to train and equip an Air Force capable of assuming this responsibility from the Coalition in a mutually acceptable timescale. This would require a substantial investment in manpower, equipment and time.

This desired end state was set against the political and military situation existing in Iraq at the time. The country was in the grip of a major insurrection. Unless this could be controlled and stability brought to the country, the long-term political goal of rebuilding Iraq could not be achieved. The IqAF, therefore, had a role to play in providing tactical support to the Iraqi ground forces, most notably the Army but also the Navy and civilian ministries with responsibility for the security, welfare and economic regeneration of the country.

Before, we had aircraft, equipment, technicians and pilots. In 2003, we lost everything but we still have the people and their talents. Many of those who believe in democracy are using their talents to build the Air Force. We also have the doors wide open to young people to join so they can bring new blood and be part of the air force.

I wish that in 10 years or even before, the Air Force expands to become equal in size to the Air Forces of Turkey and Iran and the other neighbouring countries in the Middle East. Our goal is to have jets so we can be as strong as the other nations' Air Forces.

Major General Kamal Al-Barzanjy, Head of Iraqi Air Force

Air Force Contribution to Fight Insurgency

The crocodile nearest to the Iraqi canoe was the struggle against insurgents trying to destabilise the fledgling democratic process. Whatever may have been reported by the Western media at the time, the reality in 2005, was that this was already a fierce and bloody struggle carried out by Coalition and Iraqi ground forces with support from Coalition Air Forces. The IqAF identified its key role as support to ground and maritime forces in the counter-insurgency battle. This called for air assets capable of providing rapid troop transport throughout the country, tactical movement within an area of responsibility, surveillance and reconnaissance and Close Air Support.

A secondary role was to provide air assets to assist in the defence of infrastructure critical to the economic recovery of the country (notably the oil production and pipeline systems, and electrical generation and supply grid). This required air assets capable of providing rapid response to transport Quick Reaction Forces to isolated incidents on the ground, supported by reconnaissance assets capable of patrolling the vulnerable oil pipelines and electricity grids and the long and porous land borders.

Whilst the IqAF Air Staff were analysing the roles and assessing the coordination and cooperation required to achieve these tasks, the most significant constraint facing the fledgling IqAF was that it had no combat aircraft. Therefore, in 2005, the resources needed to provide surveillance and to support Counter-Insurgency Operations had to be found from an unsuitable mix of aircraft in the IqAF inventory.

For surveillance and reconnaissance a mixed force of unarmoured and unarmed fixed wing aircraft were capable of day (Visual Meteorological Conditions) operations in a benign environment. These were the CompAir 7SL, SAMA CH 2000 and SBL7-360 Seeker.

Helicopter support could be provided by Jet Ranger and UH-1 helicopters. However, these were not equipped for combat operations, having no armour,

Faced with the classic dilemma of having to fight off the crocodile nearest the canoe, whilst trying to maintain the long-term aim of draining the swamp, the Head of the IqAF established his priorities:

- Contribute to the fight against the insurgency.
- Implement a long-term strategy for the future IqAF.

These 2 tasks actually had to be developed simultaneously, as the long-term future of the IqAF depended upon a stable country with a strong economy and an assured role within the Middle East. On the other hand, the long lead times for training aircrew and identifying, acquiring and supporting modern aircraft types meant that re-generating the IqAF could not be delayed until the right conditions had been established.

Iraqi Air Force SBL7-360 Seeker

Iraqi Air Force SAMA CH 2000

armaments or defensive aids and there was a surprising amount of resistance from within the Iraqi MOD to the Air Force having helicopters at all. However, the Head of the IqAF was pragmatic in understanding that the Air Force should be the centre of excellence for all matters concerning the delivery of air power, and this included the provision of tactical helicopter support.

A further challenge arose from the fact that the majority of the aircraft on the IqAF inventory at that time had been 'gifted' from friendly neighbouring states, but did not come with any engineering or technical support. These were types that had not previously been in service with the IqAF, so there was no pool of knowledge or expertise to draw on. Consequently, a great deal of staff effort was required to source and fund spare equipment support, technical publications and tools for aircraft, some of which had no international certification, military antecedents, engineering records or flying/modification state history.

A notable exception to this state of affairs was 3xC-130 aircraft, which had been provided by the United States Air Force (USAF). These aircraft were properly funded, equipped with appropriate defensive aids and operated by Iraqi aircrew and groundcrew, who were trained and mentored fulltime by USAF air and groundcrew. This was a fully integrated US/Iraqi unit, established with the aim of providing sufficient basic training and on-going operational experience to enable the Iraqis eventually to operate the aircraft autonomously. The C-130s also provided much-needed tactical lift capability, with sufficient range and payload to provide the IqAF with a 'strategic' capability, able to fly the flag by operating in neighbouring countries in the Middle East.

Whilst the C-130 operation was seen as a template for the re-generation of other IqAF fixed wing squadrons, it still had to be funded. The requirement to provide long-term support for 3xC-130s, as well as the sustainment, upgrade or replacement of the other types in the inventory, highlighted the relatively high cost of Air Power in even its most basic form. The IqAF had to compete against the other services for a slice of the military budget and, in a cash-based economy, the acquisition of large numbers of AK47s, military vehicles and armoured personnel carriers provided a more obvious and high profile sign to the Iraqi people, and to the world at large, of military progress than funding spare tyres, engine overhauls and equipment upgrades for aircraft.

The long-term nature of the required investment in Air Power was also highlighted by the recruitment of personnel into the Armed Forces. A soldier could be recruited, equipped and trained to a basic infantry standard in approximately 10 weeks. The drop-out rate was very low and Regiments, Battalions, Brigades and even Divisions could be brought on line relatively rapidly and at measured intervals. In contrast, recruiting, selection and training for the Air Force, where officer and pilot training initially had to be out-sourced to other nations, was measured in months and years, rather than weeks.

The necessarily higher entry standards for Air Force recruits created its own difficulties. As well as having good physical and mental dexterity, potential Air Force officers and pilots also required a high standard of spoken and written English (not only is English the accepted international language of the air, but it also tends to be the mother tongue of those nations willing and able to provide flying training facilities for Iraqi students). For the 15 or so years prior to 2005, the average Iraqi had been starved of western culture and influence in the form of books, films or other media. Access to broadcast or published media in English had not been available or restricted and the Iraqi youth had also suffered a lack of access to the Internet. Consequently, for most young Iraqis leaving school it was difficult to achieve the required standard of English

necessary to proceed to officer or pilot training. It was no surprise, therefore, that the majority of early applicants to join the IqAF tended to have been educated outside Iraq, or were relatives or children of the well-to-do or elite sections of the Iraqi community. Against this background, it was necessary to impress on those responsible for selecting recruits for the Air Force, that merely having the 'right background' or connections did not necessarily ensure a successful career as a pilot.

Despite these strictures, constraints and hurdles, by 2007, the measures put in place 2 years previously to improve the capability of the IqAF are starting to bear fruit. On the 'Headline' aircraft equipment, the IqAF has procured 10 new Mi-17 tactical transport helicopters (and support package), 16 UH-1 are being upgraded to the more capable Huey II specification, the Cessna Caravan has been procured to provide surveillance and monitoring of the Iraqi borders and natural resources, and the Beech King Air has been added to the inventory to supplement the intelligence surveillance reconnaissance assets and provide a much-needed short haul VIP transport capability to offload this task from the more capable, but more expensive, C-130.

Long-Term Strategy

In reaching its goal of being an independent air force capable of defending Iraqi sovereignty against likely threats, being recognised as a credible air power in the region, and helping to restore national pride, the IqAF faces a number of challenges. These include:

- **Equipment.** Establishing the funding, knowledge base and expertise to acquire and sustain a force of affordable yet modern, capable, jet fighters.

- **Manpower.** Identifying, selecting, recruiting and training the necessary high calibre personnel to fly, maintain, and command and control the future Air Force (initially outsourcing the training, but ultimately forming a national Air Force Academy).

- **Infrastructure.** Rebuilding airbases and command and control facilities to provide the necessary defence in depth and the disposition of forces throughout the country.

In meeting these challenges, the Iraqis must first of all convince the International Community and the Coalition Forces of their commitment and intent, whilst the IqAF must simultaneously continue to convince the other Armed Forces that an independent Air Force is a necessary part of the future of the Iraqi Armed Forces and should not be seen as a threat to single service aspirations.

Lessons Identified?

It is unlikely that any of us will ever be asked to set up an Air Force from scratch. However, certain lessons can be drawn from the experiences of the IqAF in trying to regenerate itself in the context of changing geopolitical and military circumstances. Broadly these are as follows:

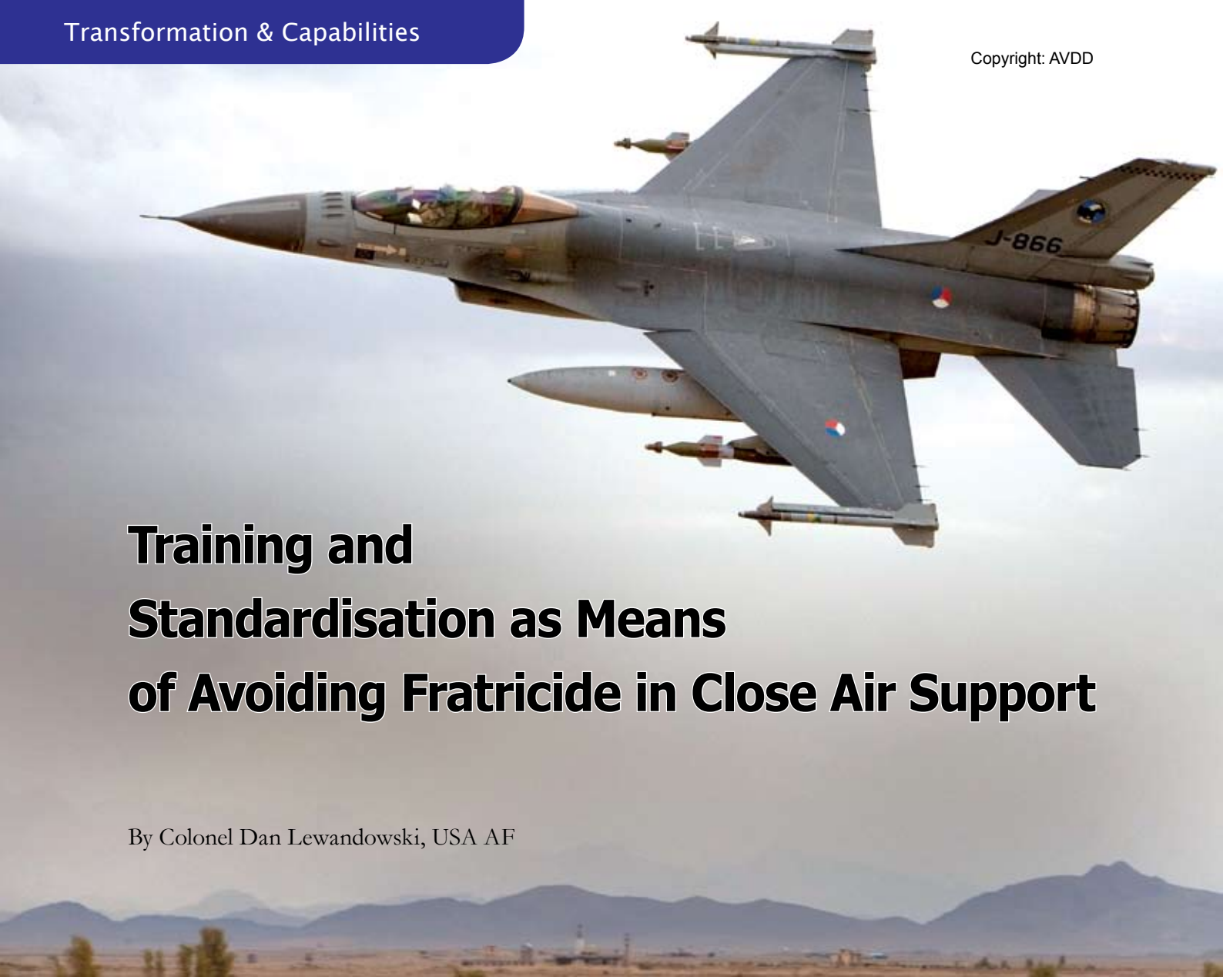
- **Independent Air Force versus a Tactical Air Arm.** When competing for scarce resources, the Airman does not have any friends in the Army or the Navy. So the arguments need to be spelled out clearly right at the outset; Douet, Doolittle and Trenchard were correct. Operating in the third dimension is not a secondary task; it requires knowledge, expertise and single minded dedication. However, in order to survive the political battle, the Airman must ensure that his task is relevant to the desired national end state and supports the other elements of the Armed Forces.

- **Long Term Investment in Men and Machinery.** Establishing an Air Force is a long and expensive process, driven by skill requirements, technology and safety. Operating in the air environment requires long term investment in personnel and equipment and the benefits of that investment may not be tangible for at least the first 3 years of the project.

- **Equipment must be fit for purpose.** Aircraft must be capable, survivable and interoperable. It is no longer appropriate to bolt a camera onto an airframe and expect it to perform a useful function in a hostile environment. Air power roles are becoming increasingly specialised but, in order to be effective, the right level of air power must be delivered to the end user at the right time and in the right format. This requires appropriate platforms, weapons, radios, ISR exploitation capability etc.

- **Finally, do not underestimate the Airman's Indomitable Spirit.**

No matter what the privations, frustrations or dangers of his job (and there were occasions when members of the IqAF literally risked their lives, and those of their families, just to come to work), the Airman's eyes will light up and his spirits will lift when talk amongst fellow Airmen turns to 'slipping the surly bonds of earth.' ■



Training and Standardisation as Means of Avoiding Fratricide in Close Air Support

By Colonel Dan Lewandowski, USA AF

It was a Monday in the Arghandab river valley in southern Afghanistan. It was not a normal Monday though. This Monday was the third day of Operation *Medussa*, the Canadian-led offensive against the Taliban. It was the goal of NATO and the International Security Assistance Force (ISAF) to establish proper government authority in the province of Kandahar. Nearly all the fighting took place during 1-10 September 2006, but Monday, 4 September was a day that all who took part in Operation *Medussa* will remember. In an area dotted with small farming villages, the main target was the town of Panjwayi, about 30 km west of the city of Kandahar. This was another day of heavy fighting between ISAF forces and the Taliban. Canadian forces had already lost three soldiers in the operation, but on this day a series of events would lead to a United States Air Force aircraft attacking the wrong target. One Canadian would die and 15 would be injured in the attack.

Warfare Has Changed

Warfare over the past 20 years has changed greatly. Any force that tries to employ the tactics of the 1980s against a modern fighting force will be quickly destroyed.[1] Two of the many, many changes have been: first, the transformation from a linear battlefield to that of a non-linear battlefield, and second, the change in distances between dispersed smaller forces.

For many centuries there was a line that separated the two opposing forces. During the Cold War, NATO called this line the Forward Edge of the Battle Area (FEBA). In the most simple of plans, the goal was to push the FEBA forward until all opposing forces were defeated, you occupied all the territory of the opposing nation(s), or your enemy surrendered.

Today, in most combat situations, there is no FEBA. The battlefield has become non-linear. Enemy and friendly forces often get mixed together on the battlefield. Opposition can show up behind you, in front of you, or beside you. Additionally, as NATO experienced in the

Balkans, unethical combatants will intentionally mix civilians into their forces or convoys to protect themselves from attack. The dimensions of the battlefield have become less clear and non-linear. There still may be a time when the more classical linear battlefield situation will apply, but today, we are experiencing mostly a non-linear battlefield.

The second major change is the great dispersing of smaller forces. During the Battle of the Bulge in 1944, around 263 Allied soldiers per 100 square kilometres faced Axis forces numbering about 635 soldiers per 100 square kilometres.[2] By comparison, today ISAF soldiers number 7 per 100 square kilometres.[3] Due to the need to move quickly, and because there is no front line versus rear line, it is challenging to safely and effectively utilise Close Air Support (CAS). Today's smaller, more dispersed forces rely on training, superior technology, and overwhelming firepower from CAS.

The dominance of Air Power has enabled small forces to live through engagements with much larger forces, and sometimes defeat them.[4] Air Power, when combined with precision guided munitions, is much safer to use in close proximity to ground forces than in the past. Ground forces must have a high degree of confidence that friendly forces will be unharmed, even when Air Power is being directed to attack targets as close as (or even closer than) 500 meters away.

'From these reports, more than 25 actions have been recommended to improve NATO air to ground operations.'

The result of these changes has been an increasing demand for highly accurate CAS. Fixed wing aircraft and helicopters can cover a large area, quickly respond to an air support request from troops in contact, and accurately apply firepower while minimising collateral damage. The importance of CAS is quite evident in Afghanistan where ISAF forces routinely depend on it for survival. Unfortunately, the benefits of CAS can be greatly diminished by a few bad experiences. That is to say, if CAS kills friendly soldiers, even a few times, then the soldiers in the field can become more reluctant to call for air support. When they don't call for CAS, those on the ground become more vulnerable and all involved get less proficient in its use.

How to Avoid Fratricide

Fratricide comes from two Latin words that roughly mean 'to kill your brother.' NATO is working hard to minimise such tragedies. Shortly after 4 September 2006, the first NATO investigation teams were sent into theatre to examine air-to-ground operations. Between the Nations involved and NATO, there are at least 5 separate reports that have been written or are still in the process of being written. From these reports, more than 25 actions have been recommended to improve NATO air-to-ground operations. It is beyond the scope of this paper to elaborate on all of the recommendations. For simplicity sake, the recommendations fall into two major categories: training and standards.

Training

The main training occurs with the ground personnel, who call in the air strikes, and the pilots or operators of the aircraft, helicopters or unmanned aerial systems. In warfare today, the fixed-wing aircraft are normally a great distance away from the target when they launch their precision guided munitions, so the ground person, the Forward Air Controller (FAC), is critical

Joint Tactical Air Control team train at the Utah Test and Training Range.

NATO Report	Issues / Areas Reviewed
The Bi-Strategic Analysis Lessons Learned (BALL) Team's report on Air-to-Ground Operations in ISAF – Fratricide Prevention	The BALL report divides the issues into 12 categories: Command and Control, physical /psychological, procedures, identification, equipment/technology, communications /information, environment, platform configuration, pre-deployment preparation, teamwork, situational awareness, and cognition.
The Joint Terminal Attack Controller (JTAC) / Forward Air Controller (FAC) Assessment Team (JAT) Report	The JAT report reviewed 21 areas: Understanding Collateral Damage Estimates, Understanding Rules of Engagement, Understanding documented guidance such as the STANAGs/SOPs/FRAGO, Training Requirements, Training Documentation, Rotary Wing Training, Indoctrination Training, Required Equipment, Actual Equipment, Proficiency Requirements, Desired Equipment, Language Issues, CAS Response Times, Best Practices, Air Support Request Process, Mission Report Process, Feedback/ Crosstalk Process, Talk-on quality, Airspace deconfliction, JTAC procedures, Oversight Procedures.

From these 2 separate fratricide reports, actions have been recommended to improve NATO air to ground operations.

Training Variations	Description of the Training
Fixed Wing versus Rotary Wing	Is the Forward Air Controller (FAC) trained in working with both types of aircraft as they have different procedures?
Day versus Night	Is the FAC trained in both Day and Night Operations?
Single aircraft versus Multiple Aircraft	Is the FAC trained to control the airspace for multiple aircraft in the area or just for one?
Benign training versus under fire	Did the training occur in a peaceful area, or did the FAC's training occur while real bombs were exploding and the FAC was being shot at?
High versus Low Altitude CAS	Was the FAC trained in high altitude CAS or low altitude CAS, or both?
Minimal equipment versus all equipment	Did the FAC train with all the possible equipment (laser range finder, all possible radios, ROVER, PRISM, etc.) or did the FAC have minimal equipment to use during training?
Types of aircraft (F-16, Tornado, F-15E, A-10, etc.)	Does the FAC know the capabilities of each of the different NATO aircraft or did the FAC train with a small trainer-type aircraft that simulated a fighter/bomber?
Types of munitions	Does the FAC know all the types of munitions and their impact to the target?

NATO and ISAF identified several areas of concern regarding FAC training.

to the process. The FAC can also be called the Joint Terminal Attack Controller (JTAC). FACs need to provide very accurate targeting data, they need to understand what effect those weapons will have on the target and their danger areas and limitations. A FAC needs also to be able to control the airspace in that area so that multiple aircraft or other weapon systems can support the operation. During the Cold War, NATO had a FAC (Basic level) training school in Furstenfeldbruck, near Munich Germany. With the downsizing of militaries at the end of the Cold War, NATO closed its FAC School and decided to rely on national training schools for FACs/JTACs. The closure of the NATO school and the increasing demand for FACs has become a problem since approximately 1995 (the first operations in Bosnia) because not all nations have their own FAC school and many want or need FACs in their ground units. In the late 1990s, the numbers of FACs were low, in the hundreds. In the near future, the number of NATO FACs is expected to grow to nearly 2000.

Training has become more complicated over time and shifted the focus from low to medium skill level, using the advances in night capabilities and more electronic methods of determining positions and transmitting data. The most basic training is initial training and currency training. NATO and ISAF have identified several areas of concern regarding training. For example, for in-theatre currency training, when operations are slow and air assets are not available, can be very difficult to accomplish. Nonetheless, NATO is working hard to improve opportunities and options for training, including research into the possibility of setting up a new CAS, FAC Training Centre of Excellence.

A Canadian F-18 Hornet from the 409th Tactical Fighter Squadron launches a laser-guided bomb.

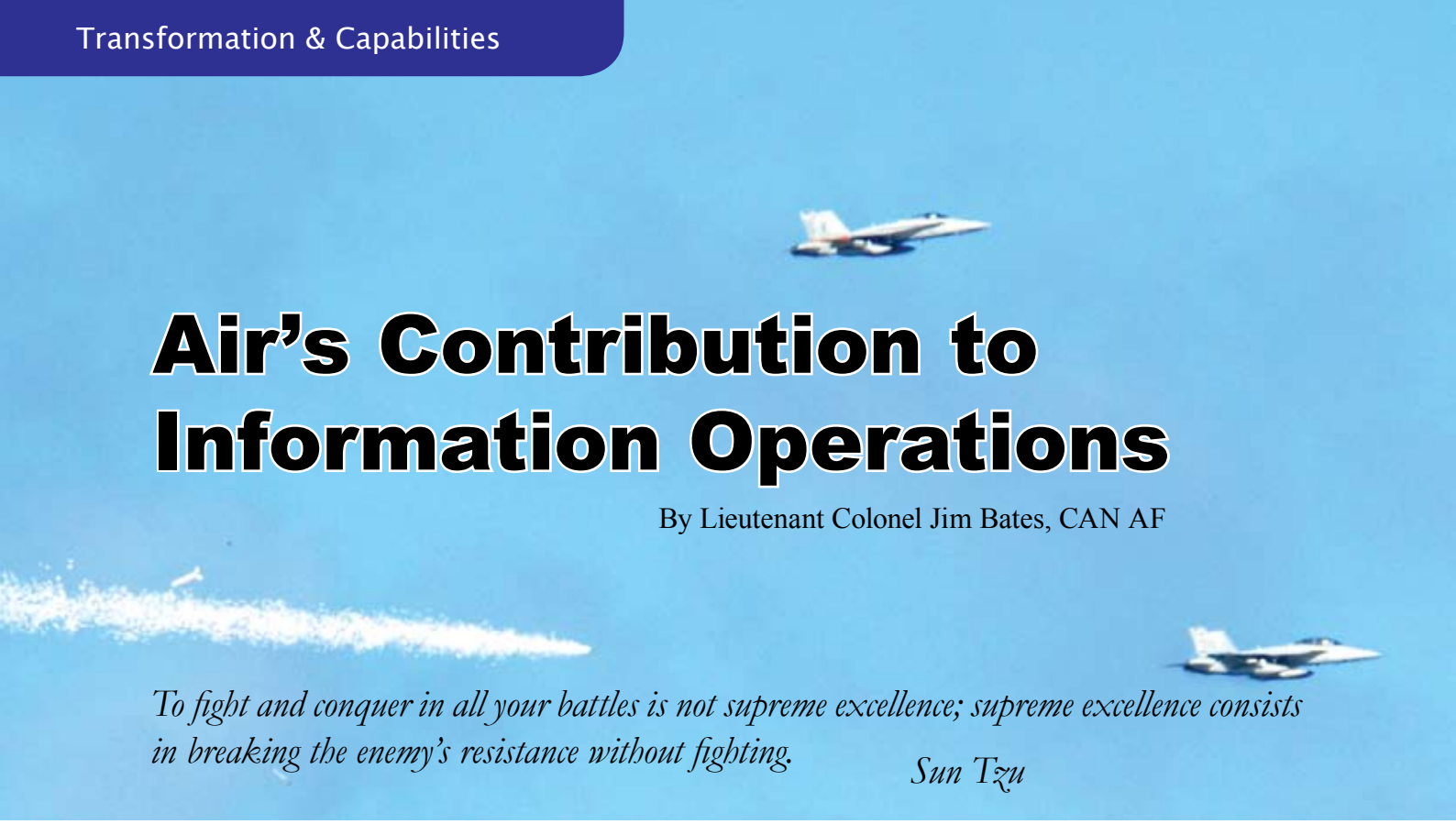
Standardisation

Standardisation is important in many areas. For coalitions to work together effectively, a standard language, standard terminology, standard procedures, standard training and standard equipment are all needed. NATO is strong in the area of standardisation as NATO Standardisation Agreements (STANAGs) form the basis of Alliance interoperability. STANAG 3797 is the STANAG for Minimum Qualifications for Forward Air Controllers and Laser Operators in Support of Forward Air Controllers. STANAG 7144 contains the tactics, techniques, and procedures for CAS Operations. Every NATO Nation and ISAF coalition partner conducting or requesting CAS should be intimately familiar with these documents. When combined with the theatre specific guidance, they form the basis for how the coalition works together. The STANAGs provide such information as the types and numbers of controls that a FAC must complete successfully in order to become certified, as well as the different methods that can be used to mark a target. As warfare changes, so too must the STANAGs. To that end, STANAGs 7144 and 3797 are being updated regularly. To further aid the standardisation process, some NATO and non-NATO Nations have signed a Memorandum of Understanding (MOU) regarding FACs. This MOU and the very similar NATO STANAGs are helping to ensure all Nations are effectively working together in ISAF.

There is a difference between lessons identified and lessons learned. NATO is determined not only to identify the lessons from its mistakes, but to also learn and implement the proper ways to prevent them from happening in the future. Incidents like that of 4 September 2006 must be prevented. With good training, proper standardised procedures and good equipment, the use of CAS will be sure to apply firepower at the proper location and thus avoid fratricide. ■

Endnotes:

1. Example: The 2003 Iraq War - Suddam Hussein's 20th Century forces versus the coalition's 21st Century forces.
2. These numbers were calculated using the area of operations map as depicted in 'Reference Guide to United States Military History, 1919-1945,' page 77 (for the area) and the combatant numbers from the Wikipedia website, http://en.wikipedia.org/wiki/Battle_of_the_Bulge
3. This assumes that ISAF is responsible for about ¾ of the area of Afghanistan (about 485,000 square kilometres out of the total 647,500 sq km) with 35,000 ISAF personnel.
4. Examples include the Battle of Tora Bora in December 2001 and Operation Anaconda in March 2002.



Air's Contribution to Information Operations

By Lieutenant Colonel Jim Bates, CAN AF

To fight and conquer in all your battles is not supreme excellence; supreme excellence consists in breaking the enemy's resistance without fighting.

Sun Tzu

Fighters delivering leaflets over Afghanistan

Air Power contributes significantly to achieving the intended effects of Information Operations (Info Ops), yet on a broader scale it sets the conditions to enable the execution of Info Ops. Alternatively, wielding such awesome power has the potential to ruin the prospects of realising the intended results of an Info Strategy. 'The delineation between what constitutes Info Ops and what constitutes "mainstream" military activity is becoming increasingly blurred as effects-based thinking is pursued.'[1] Ultimately, the commander will consider all means of achieving the desired effect from the outset and decide the appropriate course of action utilising both kinetic and non-kinetic means. Developing core military competency to realise the intended consequences, and being prepared for the unintended consequences of our action in pursuit of peace, is vital to successful security and stability operations. To that end, Info Ops education and training is essential, especially for air planners.

What is Info Ops?

NATO's draft Info Ops doctrine defines Info Ops as 'coordinated actions to create desired effects on the will, understanding and capability of adversaries, potential adversaries and other approved parties [referred to as the target audience] in support of Alliance overall objectives by affecting their information, information-based processes and systems while exploiting and protecting one's own.'[2] Creating desired effects on the will, understanding and capability of the target audience is the key phrase in the definition. There are several capabilities, tools and techniques that form the basis of most Info Ops activity including: Psychological Operations (PSYOPS); presence, posture and profile; Operations Security (OPSEC); Information Security; deception; Electronic Warfare (EW); physical destruction; and Computer Network Operations (CNO).[3] The draft doctrine points out that only when tools and techniques are used directly to influence will, affect understanding or affect a decision-maker's C4ISR capability can they be deemed part of Info Ops activity.[4] Although it includes a physical destruction component, Info Ops is largely a non-kinetic action that increases the Commander's choice of means by which effect can be achieved at all stages of a crisis.

Since a decision-maker's effectiveness is a function of his will, understanding and capability, affecting any one of these elements affects his ability to act and gain support. During Gulf War I, both kinetic operations and PSYOPS programmes directly influenced the will of Iraqi troops, who surrendered to coalition forces – many holding PSYOPS leaflets dropped from the air. Conversely, it could be argued that the will of Saddam Hussein was unaffected during both Gulf Wars. However, his ability to act in the way that he wished was directly affected by coalition air attacks on his command and control systems (an example of the use of

physical destruction for Info Ops purposes). These attacks affected Saddam Hussein's understanding of the situation and his ability to command.[5]

Impact of Shaping on Info Ops

While the principal effect sought through the use of physical destruction will often lie outside Info Ops, the use of force sends a strong message and, consequently, the direct application of force will have significant psychological impact on the target audience, which usually includes the population caught in the conflict. Gaining their support is a precondition to achieving the strategic aims, so understanding the consequences of physical destruction in that context is the challenge for military planners. Ultimately, the desired outcome of conflict should be the return to peace, so as Kemsley points out, to achieve a peaceful end state we must make a cognitive transition as well as a physical one – to build widespread recognition, or cognition, that the adversary cannot succeed and that his ends are less attractive than any alternative.[6]

Influencing the kinetic shaping action, usually associated with the initial phase of conflict and usually delivered from the air, to achieve the desired effects set out in the Info Strategy will have long-term benefit. Attacking 'crony' targets during Operation *Allied Force*, facilities chosen for air attack in part because they were owned by Milosevic's inner circle of friends and supporters, contributed to halting the killing of Albanian civilians. And the swift and overwhelming application of Air Power over Baghdad in the early days of Operation *Iraqi Freedom*, which came to be known as 'Shock and Awe,' attempted to destroy the enemy's will to resist. Both sought to bring an end to the conventional war in the most effective way, but they also set the conditions for follow-on security and stability operations and contributed to influencing the will, understanding and capability of the target audience. Our understanding of the social and political ramifications of that shaping action will serve to set the stage for ongoing Info Ops.

Air's Contribution to Info Ops

Air Power contributes significantly to Info Ops whether as an influence activity, a counter-command activity or an information protection activity; the 3 core activity areas of Info Ops. The draft NATO Info Ops doctrine describes the importance of presence, posture and profile. The impact that the mere presence (or threat) of force may have on an adversary's perceptions and behaviour can be significant. Combining that with air's ubiquitous characteristic adds substantial credibility to deterrence messages. 'Coalition forces' counterinsurgency operations in Afghanistan blend precision kinetic and non-kinetic air activity as part of the 'graduated response' options being requested

Copyright: Commonwealth of Australia

When pressed, are you able to explain how Air Power contributes to winning the peace?

To achieve a peaceful end state we must make a cognitive transition as well as a physical one.

by on-scene commanders. The early use of non-kinetic air power techniques has been seen in attempts to control or suppress situations, deter further escalation and, ideally, obviate the need for destructive force.'[7] An after-action report by the US Army stated 'Air Presence missions proved to be a very effective use of airpower during Afghanistan's presidential elections and inauguration ceremonies … [that] allowed the Army to significantly economise its forces.'[8]

PSYOPS is another area to which air contributes. The primary purpose of PSYOPS is to influence the perceptions, attitudes and behaviour of selected individuals or groups in accordance with the Info Strategy.[9] In advance of a recent Canadian-led land offensive against the Taliban in Helmand province of Afghanistan, leaflets were dropped from the air warning the population not to support the Taliban fighters in the upcoming offensive. In response, the Taliban withdrew from the villages in the area.

'Our understanding of the social and political ramifications of [the] shaping action will serve to set the stage for ongoing Info Ops.'

Within the information protection activity, OPSEC is used to identify and protect information that is critical to the success of the campaign and is described as essential elements of friendly information. Gaining and maintaining air superiority goes a long way to protect friendly information by denying, degrading or destroying the adversary's intelligence collection capability. Air superiority allows airborne assets to roam freely in support of Info Ops. Airborne EW capability has a wide application in the area of OPSEC, for example to obstruct the adversary's situational awareness of friendly activity, but also in the counter-command activity; to disrupt, degrade, deceive or destroy an adversary's information, command, propaganda and associated systems, processes and networks. Airborne signals intelligence, while providing over-watch protection to land forces and gathering vital information on the enemy, can also serve to undermine the adversary's ability to develop, disseminate and execute sound decisions through PSYOPS and deception. With computer networks extending more and more to mobile airborne platforms, CNO that include Computer Network Attack, Exploitation, and Defence are becoming a vital air activity as well.

The 3 core Info Ops activity areas can make use of all or any capability or activity that can exert influence, affect understanding or have a counter-command effect; the extent is only limited by imagination, availability and policy. The means available to the commander to defeat the adversary through kinetic and non-kinetic action are many. The challenge is selecting the right mix of capabilities, tools and techniques to influence the target audience's perception and behaviour that ultimately leads to a peaceful outcome. Military planners need to consider the comprehensive social, political, and efficacy implications in the application of force.

Related to Info Ops are activities such as public information and Civil-Military Cooperation that support the establishment of legitimate government and public institutions. They also depend on direct and indirect support from air such as security afforded by air superiority, humanitarian assistance, air logistics, medical support, transport for government officials to remote areas, space operations to support satellite communications and more. These types of operations, which directly affect and are visible to the population, can have significant effects in the overall campaign against an adversary.

Info Ops Education and Training

This article has merely scratched the surface of Info Ops, but it shows the breadth of air's contribution. Not discussed is targeting coordination, a Joint process that is anchored in the air tasking cycle and is fundamental to achieving the desired Info Ops objectives. All this is to say that Airmen need to understand Info Ops. Air not only contributes to, but it also sets the conditions to enable the execution of Info Ops. NATO's School in Oberammergau offers two Info Ops courses: a one-week course for senior officers and a two-week orientation course for Info Ops staff officers. Both are highly recommended for air planners, to appreciate the means to create desired effects on the will, understanding and capability of target audiences in support of Alliance overall objectives. ■

Endnotes:

1. Draft AJP-3.10, Allied Joint Doctrine for Information Operations (4th Study Draft), January 2006, 1-9.
2. Draft AJP-3.10, 1-3.
3. Ibid.
4. C4ISR stands for command, control, communications, computers, intelligence, surveillance, and reconnaissance.
5. Draft AJP-3.10
6. Harry Kemsley, 'Air Power in Counter-insurgency: A Sophisticated Language or Blunt Expression?' *Contemporary Security Policy*, Vol. 28, No. 1 (April 2007): 112-126.
7. Ibid., 117.
8. Ibid., 117.
9. Draft AJP-3.10

Info Ops education and training is needed to appreciate the means to create desired effects on the target audiences.

Photo Courtesy of Travis Air Museum

Hauling Trash for Strategic Effect

By Wing Commander Pete York, GBR AF

Control of the Air remains a decisive element in military conflicts; without it the ability to manoeuvre of land and maritime forces is severely restricted, lives are placed at unacceptable levels of risk and the non-kinetic effects of Air Power are rendered impotent. Yet, over recent years, the nature of conflict has changed. Air Forces and NATO have transformed from traditional static geographic defence organisations, where the primary use of Air Power was to provide the necessary level of air control into a worldwide deployable 'Force for Good,' whose aim is to promote peace and stability. In so doing, the emphasis on systems capable of delivering kinetic effects has reduced in favour of increased support to non-kinetic capabilities. Air Transport, Support Helicopters and C4ISTAR[1] capabilities have never had it so good. But who would believe that non-kinetic Air Power capabilities could achieve strategic effects without a 'shot being fired'? This article will show how the Berlin Airlift not only achieved strategic effect, it may also have prevented World War III and it contributed in a highly significant way to the psychological recovery from World War II.

Political Background

In March 1946, in a famous speech at Fulton, Missouri, ex-British Prime Minister Winston Churchill declared that an Iron Curtain, extending from Stetting in the Baltic to Trieste in the Adriatic, had descended upon Europe. Germany was divided into four zones allowing each Ally to run its division by a military government until a suitable national government could be devised and the country put back together. Berlin, the capital city, deep in the Soviet sector, had been divided in half. The Western Allies controlled West Berlin, the Soviets East Berlin. The 2 million people living in West Berlin were supplied from outside the Soviet sector by roads, railroads, canals, and three air corridors, which led to Berlin from the German cities of Frankfurt, Hannover and Hamburg and were each 20 miles (32 kilometres) wide.

Relations between the Soviet Union and the West were already tense, when in February 1948, a Russian-engineered communist take-over of Czechoslovakia showed the rest of the world how the Red Army's gains in the War were to be consolidated. The dispute over Germany escalated after United States President Harry S Truman refused to give the Soviet Union reparations from West Germany's industrial plants; Stalin responded by splitting off the Soviet sector of Germany as a Communist state. On 22 June 1948, the situation deteriorated still further when the Soviet Union, in an attempt to force out the Western Allies, stopped all ground traffic to Berlin. Only the air corridors, which were protected by treaty, remained.

The commander of the United States occupation zone in Germany, General Lucius D. Clay, proposed sending a large armoured column driving peacefully, as a moral right, down the Autobahn from West Germany to West Berlin, but with instructions to fire if it were

stopped or attacked. President Truman, however, believed this entailed an unacceptable risk of starting World War III and ordered an investigation into the feasibility of an Allied operation to re-supply Berlin by air.

The Berlin Airlift

Codenamed Operation *Vittles* (because they were supplying food) by the United States Air Force (USAF) and Operation *Plainfare* by the Royal Air Force (RAF),[2] the aim at the outset was to supply 200 tons of food, coal and raw materials per day by air in an operation which was expected to last 3 weeks. In reality, the operation lasted 321 days and on Good Friday 1949, an incredible 12,940 tons of cargo were flown into Berlin. This was a massive joint operation as soldiers and sailors were recruited to load and offload the aircraft. Aircraft were streamed in at 3 minute intervals vertically separated along the corridors by 500 feet. The RAF flew in along the Northern Corridor, the USAF the Southern Corridor and all departed by the Centre Corridor. Aircraft were permitted one approach only; if they didn't land, they overshot and returned their load to West Germany.[3]

Lateral thinking by RAF planners led to the opening of an additional 'runway' on Lake Havel with the addition of Sunderland flying boats, which flew from Finkenwerde on the Elbe near Hamburg to Lake Havel. The flying boats' speciality was transporting bulk salt, which would have been corrosive to the other aircraft.

In all, more than 2.3 million tons of supplies and 277,685 flights were taken into Berlin over a 10 month period[4] and on 12 May 1949, the Soviets relented and reopened the ground routes to Berlin. The Allied operation had cost the lives of 39 British and 31 American aircrew and the loss of 24 Allied aircraft in flying accidents.

The success of the Berlin Airlift carried much more significance than victory against a perceived new enemy. The airlift became a model for future airlift operations and, importantly, Army, Navy and Air Forces had worked together, which was a significant achievement at that time. New aircraft, specifically designed for air cargo operations were based on the lessons of Operations *Vittles* and *Plainfare*; the C-130 Hercules, C-141 Starlifter, C-5 Galaxy and the C-17 Globemaster all owe their origins to this operation.

Most importantly though, the Berlin Airlift began to repair some of the psychological wounds of World War II. There was genuine empathy for the people of West Berlin, where, less than five years earlier, many of the same pilots had been dropping bombs on these same people. Many with guilty consciences about dropping bombs on civilians now found redemption in helping them survive.

Conclusion

The Berlin Airlift was undoubtedly one of Air Power's most magnificent achievements. Its planning and execution took courage, determination and exceptional skill and airmanship. Not only did it achieve its aim, it may have prevented World War III, it improved jointery and it contributed significantly to establishing a lasting peace in Europe. There is more to Air Power than just dropping bombs. ■

Endnotes:

1. C4ISTAR stands for command, control, communications, computers, intelligence, surveillance, target acquisition and reconnaissance.
2. Alongside the British and US troops running the airlift were airmen from Australia, Canada, New Zealand and South Africa.
3. One RAF pilot who got too close to the aircraft in front is recorded to have deliberately transmitted the sound of his 'undercarriage up' warning horn when the pilot in front was on his final approach. On hearing this alarm, the leading pilot believed it to be his own and overshot, allowing his successor full access to the runway. This may have cost beer in the bar later!
4. By comparison, the airlift into war-torn Sarajevo between 1992 and 1997 brought in 179,910 tons, which was less than the average amount flown into Berlin in 1 month!

Sunderland flying boats transported bulk salt from Elbe to Berlin, landing on Lake Havel.

Interview with Lieutenant General de Jong Commander Royal Netherlands Air Force

Conducted by Wing Commander Pete York, GBR AF

Sir, the transformation of NATO Air Power from its static, defensive Cold War posture to develop pro-active, dynamic capabilities that can support expeditionary stability and security operations world-wide is an ambitious and demanding requirement, which will take a number of years to implement. Where does the Royal Netherlands Air Force (RNLAF) stand in the transformation process now and what do you see as your priorities for urgent change in the immediate future?

I am content that the Dutch Armed Forces are well established on the road to transformation. At the beginning, in 1991, we believed that we already had an expeditionary capability. However, we have applied a lot of effort to improving that start and we have become much better at it.

As a general principle, I aim to achieve 5 operational elements to each one deployed so that each unit and therefore each person in the RNLAF can expect to deploy on operations for no more than 3 months every 15 month cycle.

The heart of the RNLAF is our fighters, helicopters and guided missiles. We have 5 operationally capable F-16 Squadrons, each with 18 aircraft. Fighters have gone as far as they can go in the transformation process. Missile batteries are operationally ready and have been deployed and used in both Gulf Wars.

We have enough Air Transport to sustain our Air Force jet operations. We have 4 x C-130 with enough crews to deploy one aircraft indefinitely and 3 x DC-10 dual role Tanker/Transport aircraft. This is not enough to deploy our missile capability rapidly or to deploy and sustain the Army and the Navy. When we do not have enough RNLAF Air Transport, we charter civilian aircraft for the task.

The RNLAF operate Apache attack and several types of support helicopters. We are building up our personnel resources such that by the end of next year we will have the five-to-one ratio, which will enable us to deploy these assets indefinitely.

The C-130 is the life line for deployed operations.

The NATO equation is not as simple as saying that all member Nations' Armed Forces need to be expeditionary; some nations need it more than others. For some NATO nations, defending NATO's borders is *happily* an expeditionary operation. On the other hand, nations around the periphery of NATO's borders need to focus more on in-place forces in order to fulfil their Article 5 commitments.

The Netherlands is a major force contributor to the International Security Assistance Force (ISAF) in Afghanistan. After a troublesome period, progress is being made in that country to improve the ultimate prospects of a peaceful resolution and long term stability. What part has Air Power played in arriving at this point and where should we be focussing our efforts in the future to build upon this sound base?

I am optimistic about the future of Afghanistan, but there is much illiteracy and corruption there, which must be overcome before effective self-government will be possible. Until that is achieved, the power of the rifle will prevail and it will be one or maybe even two decades before Afghanistan will become completely independent.

In the context of effects-based operations, achieving a peaceful outcome is primarily a political objective; the military is only one tool in the political leaders' bag. However, within the Joint military effects, there is not a single operation that does not begin or end with the application of Air Power and, quite simply, without Air Power there would be no ISAF.

Security and Stability operations strike a balance between Peace Support and Peace Enforcement. Current doctrine leads us to apply the 'Comprehensive Approach' to these operations, which aims to coordinate the effects of diplomatic, information, military and economic instruments in order to arrive at the desired (peaceful) outcome. Experience has shown that it is challenging to draw all these organisations together to achieve this ideal. The challenge is compounded in the multinational coalition or NATO Alliance context. How do you suggest that we should approach this challenge?

We have shown in the Balkans that it can be done. However, from a civilian perspective, organisations are saying that they wish to bring peace and stability to the world, but frequently they do not have a good plan of the effects that need to be achieved to establish that overall goal.

International Organisations and Non-Governmental Organisations are ever present, and for the very

'The utility of fighters and, therefore, the kinetic aspects of warfare have been reduced considerably over the last 15 years.'

best of reasons, but there are large gaps in the coordination of their efforts with those of other resources.

The solution is to make a plan before coalitions venture into this type of operation. Make a plan, define the objectives and coordinate the efforts of all participants to achieve those objectives in harmony.

We learnt a significant planning lesson in Srebrenica, when troops and population on the ground suffered heavy casualties because NATO air cover was not forthcoming. That experience has taught us that we will not go into any operation anywhere in the world without the ability to support our troops on the ground *with our own aircraft* and, although 90% of our air effort has been in support of multi-national commitments, we reserve the right primarily to support our own National forces first.

Air Power should be capable of bringing a balance of kinetic and non-kinetic force capabilities to complex Peace Support Operations. There will be occasions, such as the Pakistan Earthquake Relief operation, when Air Transport and Support Helicopters will be more stretched than combat aircraft. Where do you see the stress points in establishing this balance and, importantly, what difficulties do you face in obtaining government funding for the procurement of this balance of capabilities?

The utility of fighters and, therefore, the kinetic aspects of warfare have been reduced considerably over the last 15 years. In 1990, we had 9.5 squadrons of F-16s and 12 Fokker Friendship transport aircraft. Now we have 5 x F-16 squadrons, 3 x DC-10 and 4 x C-130 aircraft, numerous smaller fixed wing transport aircraft and a much broader support helicopter capability. In short, we have become less kinetic and more non-kinetic and I expect this trend to continue.

Military capabilities are of great importance for political ambition, especially those in Foreign Affairs. We must realise that Air Power plays a vital role in Foreign Affairs – for example, if there were a need to fight forest fires in Portugal or recover from a natural disaster such as an earthquake or tsunami, then it would be Air Forces who would be the first consideration, the first and the most effective on the scene.

The operational capabilities of Unmanned Aerial Vehicles and Unmanned Combat Aerial Vehicles (UAV/UCAV) to accomplish the dull, dirty, dangerous and long endurance tasks previously undertaken by manned Air Power are increasingly apparent. What is The Netherlands doing to stay abreast of this technology and what is your view of the future?

The Netherlands has recently opted out of the Medium Altitude Long Endurance UAV programme. This was mainly for financial reasons, but also because many other nations are procuring UAV capabilities and there is a finite need for these forces. My view is that you would not go to war on the strengths of UAVs alone. To date, UAVs are unprotected, vulnerable and only usable in low threat environments. Commanders today have more intelligence surveillance reconnaissance (ISR) information available to them than ever before; ISR UAV capabilities are additional to and not replacements for existing capabilities or, if you like, luxury items.

In a high threat environment, the only way to protect UAVs would be with manned air cover, such as the F-16 or, in the future, Joint Strike Fighter. I am sceptical about the ability of UAVs to replace manned aircraft in the short term. Firstly, there will be a need to replace all existing satellites because there is currently insufficient bandwidth to sustain the data transfer requirements of UAVs.

Dutch F-16s will be replaced by manned aircraft starting mid next decade.

The NATO Response Force is the key driver for transformation in NATO. The Netherlands, as a very active contributor to NATO, also takes part in this effort. To generate a capable force, training and education are key enablers; however, the cost of NATO exercises is often a limiting factor for participation. What are your thoughts on training and education, what should be the NATO approach to it and what could or should be improved to stimulate better participation by the nations? For instance, would common funding of NATO exercises have your support?

Our Air Forces are sufficiently trained and capable of achieving what we ask of them currently in Afghanistan.

The biggest challenge we face is operating together in both Joint and Combined contexts. It is vital that our Air Forces and the way we operate are understood by Ground forces and that Coalition forces are compatible but, unfortunately, to exercise in this context is simply too expensive. Common funding of exercises sounds good, but it is not a panacea. Ultimately, those exercises still need to be paid for by participating nations.

I believe that training for expeditionary operations should be focussed on preparation and partial training. We need a replacement for the Cold War TACEVAL[1] programme, which will test the preparation phase of deployment capabilities.

Sir, thank you for your time.

Endnotes:

1. TACEVAL, an abbreviation for Tactical Evaluation, is a training and evaluation programme which tests, unit by unit, the operational readiness of NATO forces.

A Dutch engineer explains the current and future reconstruction tasks in southern Afghanistan.

Air Power for Expeditionary Operations: Meeting the Challenge?

By Colonel Doctor Frans Osinga, NLD AF

Reasons for Concern

This article looks into the challenges Air Power faces in the future and the desired trajectory of NATO Air Power in order to meet those challenges. The good news for Air Power is that precision Air Power has come to define the image of the postmodern western way of war and arguably, at the very heart of NATO transformation, is the model of military operations that these Air Power capabilities allow. However, there is no reason to be complacent. Let me touch briefly on several interrelated factors that warrant caution.

High standards and persistent shortfalls. First, with the unblinking media eye, and the political sensitivity for collateral damage, fratricide, losses and civilian casualties, the bar has been raised quite high for future air operations. Second, we cannot and should not forget that it was mainly US Air Power that carried the day during recent air operations, as is the case in ISAF today, and not European Air Power. Indeed, the lists of NATO shortfalls drawn up in the wake of Operation *Allied Force*, such as the Prague Capability Commitments, strongly suggest that the European capability gap is an Air Power gap.

Hybrid wars at strategic distances. This continued over-reliance is becoming a military – if not political – liability if we look at the geo-political ambitions of NATO and the EU, which is the third reason for concern. NATO forces will be increasingly tasked to operate at strategic distances. Operations of the sort, scope and distance of ISAF in Afghanistan could become the norm, and this only magnifies the existing shortfalls.

Fourth, simultaneously we can observe a gradual, but distinct, change in the roles of armed forces. The prime function of the defence of NATO territory is still relevant of course. But in practice, the defence policies and budgets of nations and of NATO are heavily shaped by the assumption that Armed Forces will be called upon to conduct humanitarian operations, 'do' nation building, monitor cease fire agreements, assist elections, enforce cessation of hostilities by regimes, support coercive diplomacy, monitor power lines and oil pipe lines, and conduct counter-insurgency missions as part of stability and reconstruction operations.

Predominantly, we should expect a series of operations of smaller scale, but long endurance, with a variety of concurrent missions, in a complex demanding environment in which military forces of various nations operate alongside Non-Governmental Organisations and International Organisations against opponents such as we are engaging in Afghanistan, or that which Israel faced in the summer of 2006. This is not irregular war *or* regular war, not conventional *or* guerrilla war, high tech *or* low tech, interstate *or* intrastate, peacekeeping *or* warfighting. Instead, all of these sets of opposites converge in what US Marine Corps General James Mattis calls 'Hybrid Wars.'

Smart opponents and the empty battlefield. The fifth cause of worry is the expectation that we will face different, smarter opponents next time. Wherever we go to Asia, the Middle East or Africa, we are likely to encounter asymmetric strategies by adversaries, who are bent on spoiling our efforts to effect political change and stabilise an area. Examples abound: just look at the tactics used by the warring factions in the Balkans during the 1990s, the insurgents in the streets of Baghdad, the Taliban in Afghanistan, or by the Hezbollah last year against Israel. We are talking here about the swarming of relatively autonomous groups of insurgents/guerrillas. Alternatively, we cannot exclude the possibility we will be facing a nation state of considerable military resources with Weapons of Mass Destruction and offensive air assets.

This is not the linear battlefield but the 'empty battlefield.' All may be expected to adopt advanced dispersal and deception techniques, using urban hidings and sanctuaries, frequent movement, limiting exposure times during tactical engagements, and the deliberate and full exploitation of the presence of the unblinking media eye. Indeed, the main challenge for NATO Air Power will flow from the demands of (1) conducting expeditionary joint operations at strategic distances against (2) adaptive asymmetrically operating enemies, in (3) complex dynamic and often non-secure environments across (4) vast areas of operation as well as urban jungles.

Challenges for Air Power

Entry, basing and sustainment. Just a brief discussion of this new operating environment will illustrate the challenges we are facing. First, we need to get there and create operating bases with some measure of security. When we make an inventory of, say, Africa and Central Asia, the density of suitable airfields becomes only a fraction of what we have been used to in the Middle East or Europe. These vast distances present us with specific problems. As strategic distances of up to 10,000 kilometres will become normal, communications will require constant access to space assets. Air bridges for sustaining logistics will require substantial air transport capacity.

Force security and emerging air threats. Once established, air base security and air superiority in the lower altitudes will become a high priority task. Many studies rightfully point to the risk posed by the proliferation of latest generation surface to air missile (SAM) systems, such as the Russian-built S300. Others, looking into the more distant future, observe a looming challenge emanating from directed energy. Combined with the anticipated fielding of counter-stealth technology, these developments indeed may hold a return to the situation in which the defence dominates the offence in air warfare, a situation which could dramatically invalidate our preferred mode of operation.

In the present and near future, however, the problem is mostly man portable and readily available. The estimate of the global inventory of MANPADs stands at 500,000-700,000. To this should be added the widely available shoulder launched rocket propelled grenades. The risk to helicopters and military and civil transport aircraft, as well as to fighters in the landing phase, is tragically manifested in the mounting losses of US helicopters in Iraq and the loss of an RAF C-130 north of Baghdad on 30 Jan 2006. We will need to address this base security and low altitude air threat. We can still clear the high skies, for now at least, but at lower altitudes it looks distinctly cloudy.

The Israeli Defence Force (IDF) experience during operations against the Hezbollah in the summer of 2006 offers insight into the enhanced role of, and the demands for, responsive Air Power for force protection and theatre missile defence. The conflict highlighted the difficulties of defending against and destroying the thousands of shorter-range rockets, Kaytusha's and mortars, as well as low flying armed unmanned aerial vehicles (UAVs). Obviously such systems pose a threat to any future NATO Response Force operating base. Just the simple risk of such attacks will mandate, as in the IDF case, constant air and sensor coverage of suspected areas.

The obvious lesson is that we not only need missile defences, but also defences against cruise missiles, UAVs, artillery rockets, and short range low apogee-flight time ballistic missiles. It is also obvious that any concept of operation involves advanced battle management C2 information systems that enable Joint Time Sensitive Targeting, while employing 24/7 air presence, artillery, and Special Forces units.

Distributed operations and the increasing demand for air support. One other undeniable trend is the steady increase in demand for Close Air Support (CAS) and other counter land missions in a variety of demanding situations, be it as part of stability, counter-insurgency or peace operations. Aiming to increase

mobility and deployability, NATO expeditionary land forces will increasingly rely on Air Power to provide information as well as precision fire power. It is estimated that ground units will only bring 25% of the Cold War era organic fire support assets to the theatre. These trends will result in high demands for intelligence surveillance reconnaissance and CAS missions. Aircraft will become the flying eyes, the airborne mortar tubes and winged snipers for our troops. CAS used to be regarded as an emergency action. No longer. During Operation *Medusa*, coalition aircraft flew 900 sorties, 90% of which involved attacks in close proximity of own troops. Indeed, Air Power is now often the primary fire support means available for ground troops.

Complex environments. Meanwhile the territories our ground units will cover are increasing dramatically. Our troops will swarm around the country, operating in a non-linear distributed fashion. These huge in-theatre distances will be very significant operational planning factors and create difficulties of maintaining effective C2 across such distances. Missions will last many hours and require multiple in-flight refuelling hook-ups. The few aircraft that patrol the skies will often be in a reaction-posture and not able to shape the opponent before ground engagement. Yet responsive air support across the vast theatre requires persistence, ie, constant presence of shooter platforms, with an ability to deliver fires within 100-300 meters distance of our own troops within minutes, and with very strict identification criteria. Fratricide is a real military and political risk, as incidents in both Operation *Iraqi Freedom* and Operation *Enduring Freedom* (OEF) have once again indicated.

The geography of the urban battlespace too will pose significant challenges. The pace of operations is often high. With troops and opponents intermingled in, over and through houses and blocks, information on troop location is equally essential as it is rapidly outdated. Communication among our own ground units and air units is hampered by the built up infrastructure and the risk of fratricide and fragmentation damage to own troops is significant. Employment of stand-off weapons, standard bomb loads or armed UAVs may very well not be an option in such instances. Identification criteria will result in huge intelligence preparation efforts and strict target identification processes during battle. The airspace above it will be crowded with multiple users stacked in layers. We, therefore, need to look at urban air operations tactics, techniques and procedures, at airspace management in these crowded skies, and at munitions that can take out specific rooms and floors, but not the whole building. The granularity of air operations must become finer.

Enduring Challenges of Counter-land Operations

Only with great, focused and concerted effort can these challenges be met. We have seen some positive examples. OEF, the US experience in Fallujah - with the benefit of ample preparation time and the IDF experience with the benefit of operating from home base and with well developed C4ISTAR[1] capabilities - indicates the art of the possible.

On the other hand, the track record in the past 15 years, and current operations in Afghanistan suggest no reason for optimism. The positive trends in Air Power capabilities cannot hide the fact that we were effective mainly against large fixed objects such as massed armour, fixed Air Defence sites, airfields, government buildings, etc. Operation *Anaconda* was a recent reminder that it is very hard to develop a structure for, and maintain proficiency in such functions as:

- Integrated planning with ground units (mutual problem).
- Finding, identifying, tracking and engaging small mobile targets rapidly (mobile SAMs, Scuds, Katushyas, bands of insurgents).
- Maintaining intimacy with dispersed ground units operations.
- Responsiveness and precise effects in urban environments.

In addition, anyone involved in ISAF will confirm that, apart from the national caveats, the problems of varying sets of Rules of Engagement and the fact that different sorts of operations with diverging aims are all ongoing in the same theatre, there is a range of Joint Air Power employment issues we need to address:

- Full Motion Video, for instance, too often is still not shared beyond the owner's tactical unit, service or nation.
- Available bandwidth is limited.
- UAVs are often used for single functions and their products are not fused.
- NATO lacks proper interoperable data standards, processes and tools for sensor generated information sharing.
- CAS assets and forward air control (FAC) personnel are not exploiting modern technology for designating targets and deconfliction, often use non-interoperable equipment, and do not conduct

We must foster intimacy with ground forces - think of jointness.

pre-deployment training in a realistic multinational fashion.

- Too often the multitude of sensor platforms, ground based reconnaissance units, UAVs of all sizes, owned by a variety of nations, and the variety of command organisations suffer from inefficiency due to lack of technical interoperability and integration, as well as to dislocation of command centres and lack of communications capabilities.
- Several actual and near incidents in Iraq and Afghanistan point to the risk of an absence of effective airspace management and control.

A few nations have demonstrated that Air Power can be effective in the demanding environments we may expect to face in the future. That was always the result of national joint training and preparation, deliberate integration of various modernised systems, as well as through changes in joint processes and organisation. However, NATO Air Power, I believe, has yet to catch up. We may have combat units, weapons and C4ISTAR systems, but we seem to lack the capability to tie it all together.

The Desired Trajectory of NATO Air Power

The contours of the new planning landscape for Air Power just sketched results in a large 'to do' list if we want to keep NATO Air Power relevant for the future. The analysis points, in particular, at the need to obtain the ability to operate at strategic distances comfortably, with acceptable risk. We will need to focus on such traditionally less exciting functions and missions such as long range logistics, base operations and security, on force protection, route observation, area surveillance, counter mortar and counter missile actions, on convoy escort, and on counter-insurgency.

These missions in such a demanding environment will put a premium on the ability to observe and, if necessary, engage fleeting targets with precision, speed and discrimination. We expect a continuation of the trend in which responsive strikes are the main method for delivering fire power, be it CAS, Time Sensitive Targeting or Dynamic Targeting. To wit, more than 2/3s of attack missions these days involve actions against emergent targets, those important persons, groups, or objects that reveal their presence only briefly, and most often not before the take off of a mission.

Air-land synergy is the name of the game here. We must foster intimacy with ground forces. Think of jointness down to platoon and perhaps even squad level. Think of the integration of fighters, aviation and artillery. Think about FAC training and equipment. We expect the need for FACs will triple compared to current levels. Think also of a closer integration of air and land command centres, an enduring joint doctrinal lesson. We need to work on the glue that creates an effective force out of separate elements.

Apart from any technological solution, it is obvious that any viable concept of operation in such an environment will have integration of sensors and shooters at its core as well as a well-equipped Air and Joint C2 structure. Integration and networking can mitigate time and space factors. The only way to solve the dilemmas, constraints and rising demands lies in reducing the time it takes for relevant information to reach decision makers and weapon system operators. Integration moreover refers to precision responsive airspace management across the distributed battlespace with multiple users, low and high, fixed wing and rotary wing, with artillery and with a proliferation of UAVs on all sides. In short, expeditionary Joint Air C2 needs our attention.

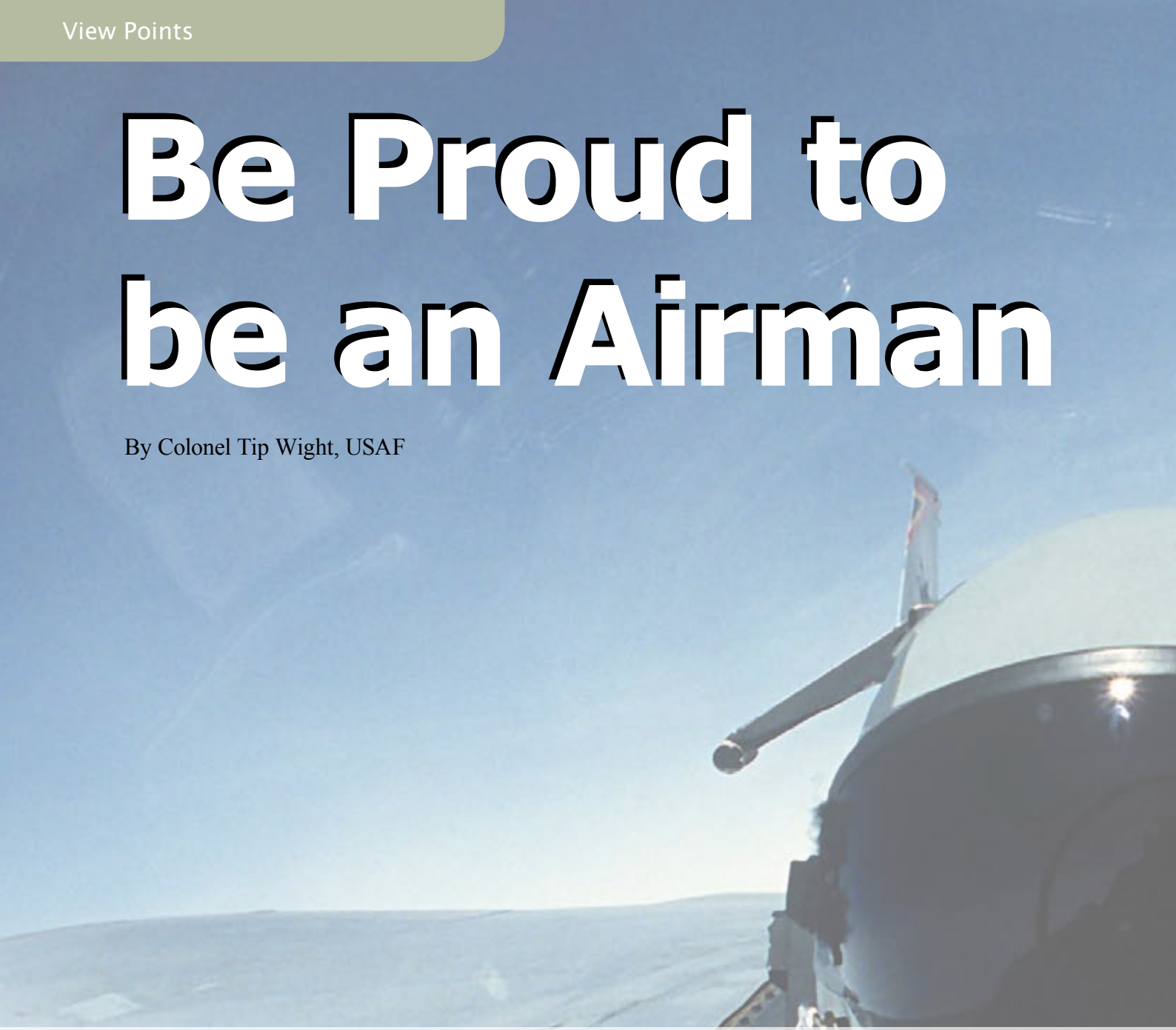
As already stated, there is no reason for complacency. ■

Endnote:

1. C4ISTAR stands for command, control, communications, computers, intelligence, surveillance, target acquisition, and reconnaissance.

Be Proud to be an Airman

By Colonel Tip Wight, USAF



Returning from duty in Operation Iraqi Freedom, Col Wight provided his personal views on United States Air Power as an Airman in a speech to fellow Airmen. That speech has been edited into an article for this Journal.

On the eve of the United States Air Force's 60th Birthday, we have a service theme of 'Heritage and Horizons.' Meanwhile, many of the key tenets of what we believe as Airmen are being constantly challenged on multiple fronts.

When I think of the current state of our Air Force (AF), it reminds me of that famous work by Charles Dickens in *A Tale of Two Cities*: 'it was the best of times and it was the worst of times.'[1] On the one hand, we have the most incredible Airmen that I've ever seen, doing the most incredible things imaginable … routinely. I watched Airmen set records day after day for cargo and passengers moved, phase hours generated, sorties flown, intelligence surveillance reconnaissance (ISR) hours available, convoy miles safely driven, explosive ordnance disabled, surgeries performed, and lives saved. I saw pilots find improvised explosive devices with targeting systems designed to destroy buildings and tanks, and fly incredibly long missions in all kinds of weather, controlled by controllers operating equipment and supported by air refuelling aircraft built in the 1950s. What's more impressive is that these Airmen did it everyday and under the most challenging conditions. Yet almost every Airman I talked to loved doing the mission and would gladly have stayed there longer. As I said, I could not be prouder - in that sense, it is the best of times!

On the other hand, I frequently saw Air Power being misused and 'penny packeted,' recalling Kasserine Pass in 1942.[2] Some may recall that this was one of the driving forces behind the

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formation of my Air Force as a separate service. While at Balad in Iraq, I saw Airmen that wanted to be Soldiers and Soldiers that wanted to be Airmen. I saw what seemed like five separate air forces fighting what seemed like at least three independent conflicts. I saw then and I see today both in Iraq and Afghanistan, cherished tenets of Air Power and principles of war that we exalt in doctrine being ignored and discarded. There seemed to be little unity of effort, there does not appear to be centralized command, and sometimes airspace de-confliction seems to be done by the 'big sky theory.' Most of this is despite the efforts of senior Airmen who have appropriate control measures in place. When I ask, many people, including *Airmen* have little idea what Air Power has contributed to our recent conflicts, outside of a few images of things blowing up. What's worse, though, is that no one seems to be able to answer the most important question: so what? Phrased differently, what effect has Air Power had toward achieving our objectives in these conflicts? Air Power's effects and capabilities don't appear to be effectively communicated to Joint service leaders or if it is being provided, it seems to be ignored. Furthermore, we face all of these combat challenges while we are in the midst of force shaping, limited resources, and an aging aircraft fleet. In this sense, to me, it's also the worst of times.

I realize that this is a pretty serious indictment and a fairly broad-brush statement, so I can see most Airmen asking, how does this apply to me? Simply put, it applies because you are Airmen and you should be able to effectively articulate what Air Power brings to the Joint fight! Our Air Force Chief of Staff is battling over these very issues every day on Capitol Hill, but it takes more than one voice. Airmen also should never

Air Power is making huge contributions across the spectrum of air operations every day.

forget the desired end state for Air Power in the context of joint combat operations: providing the most effective service capabilities to achieve joint and combined objectives. In other terms that might be easier to understand: there are some performers that have incredible dramatic or vocal talent, but you probably wouldn't go to them for parenting or hair care advice. Similarly, there are some incredibly talented athletes who can do things most of us can only dream of but, I likely wouldn't consult them on morality or ethics questions. For the same reasons, the land or maritime component should not be the ones who decide how Air Power is used. I take nothing away from our fellow service warriors. They too do the most incredible things daily and I am in awe of them as well. But as Airmen, we have a responsibility to use our unique service capabilities most effectively.

I believe that there are some key messages that every Airman should be spreading every time they get the opportunity and, if you personally can't explain them, you owe it to yourself as a professional Airman to learn enough about them so you can.

First, Air Power can be decisive. You only have to look back as far as Kosovo or *Desert Storm*. I understand that this proposition is controversial in the joint environment, but it is my (and many others') considered opinion that the end state would not have been achieved in the manner it was without the effective and decisive employment of Air Power. That may not be appropriate in today's conflicts, but remember that not all conflicts will look like Iraq or Afghanistan and we shouldn't build our military only for the present or last war.

Second, Air Power matters! We are to a large extent victims of our own success; recall that US forces have never come under aerial attack since 1953![3] That isn't an accident, but achieving air dominance like that doesn't happen without a lot of expertise and effort. Moreover, we face the challenge of operating in an environment where most of our effects aren't easy to see on the evening news. Air Power tends to be invisible, it resembles a utility; you go to the wall and turn on the switch and the light comes on, but you don't see what it took to get the electricity there in the first place. The same thing is true of what Air Power brings to the joint fight; most of the intelligence data comes from AF assets, we can't buy enough Predators to satisfy the Joint community, and every C-130 sortie can take an average of three convoys off the road.[4] Almost all of the personnel and most of the ammunition, food, and sustainment equipment arrive or are distributed in theatre by air.[5] Thanks to Air Force global positioning system satellites, incredible maintainers, weapons loaders, and skilled operators, we have the capability to put a bomb within a few meters anywhere in Iraq or Afghanistan within 10 minutes or less. But because we've become so good at

it, it's taken for granted just as we assume that the light will come on when you flip the switch. We have to explain what it is we do and what it takes to do it every day.

Third, as a Nation, we can't afford five air forces. Yes, you read it correctly. We currently have five Air Forces! If you think about it, every service has their own air arm. The Army has a huge inventory of rotary wing attack aviation and also a substantial fixed wing transport fleet. The Marines and Navy both have significant fighter/attack capabilities as well as air transport, command and control, and ISR platforms. As Special Forces grow, their air fleet continues to expand, apparently in a stovepipe, without central oversight or management. At Balad alone, we had our AF C-130s, Army C-12s and Sherpas, Army Blackhawk helicopters and Marine CH-47s, all with similar missions (intra-theatre cargo and passenger transport), all flying to almost all the same places and few of them flying to their full capacity! Why have we gotten here? In my opinion, it's all about trust and control. And, it's not service specific. The same thing happens in the Army throughout their chain of command An example is the development of UAVs. For the reasons I just mentioned, everyone wants their own UAV and tons of data is being collected, but only the individual user gets the feeds and discards most that isn't of interest to his immediate mission. Instead of this inefficient and ineffective duplication of effort in a time of limited national resources, we have to convince the other service leaders down to the tactical level that Airmen will be there when called and we have to find ways to make our capabilities available to a wider audience, faster. Moreover, if we fill the sky with UAVs that don't talk to each other, who is in charge of the deconfliction? Who sets priorities for collection? How do we employ fires in support of other missions if we can't clear the airspace? That's what a Combined Forces Air Component Commander, an Air Tasking Order and Airspace Coordination Order, and collection management authority are supposed to do.

'Airmen and Air Power have achieved incredible things and have the capability to continue to affect and win present and future conflicts.'

Finally, be proud to be an Airman! I often get a sense that some Airmen feel that they are not really contributing to the mission because they're not involved in hand-to-hand combat every day. However, as I described earlier, Air Power is making huge, unique contributions across the spectrum of air operations every day. Airmen and Air Power have achieved incredible things and have the capability to continue to affect and win present and future conflicts. However, we have to stay true to our core competencies. While it may seem like all the action is 'outside the wire' and many of our well-meaning Airmen want to go do light infantry work to 'get into the action,' I believe that's not where our skills and training are best served. Those are core competencies of the land forces and I believe we should let them do it. Today, as a result of 'in lieu of' taskings, we're spending a lot of time and effort effectively training Airmen to be Soldiers and Marines. I believe this could cause us to lose focus on what has made us the most dominant Air Force the world has ever seen. To put it bluntly and to twist my previous example further, don't ask a pop singer to sink a game-winning three pointer and don't be ashamed to be an advocate of Air Power! Remember, it's not about building Airmen up at the expense of others; it's about most effectively using our unique capabilities and that's good for everyone in the joint community.

That brings us full circle, back to where we've been and where we're going. You know the challenges before us. It's Airmen like you upon whom our future rests. We cannot and should not forget our unique heritage and capabilities as we meet future challenges. We also cannot afford to sit back on our accomplishments and become complacent while the world changes around us. Finally, if you take nothing else from this article, remember these key messages: Air Power can be decisive; Air Power really does matter; we only need one Air Force, and be proud to be an Airman! I'm proud to be one and I'm honoured to serve with fellow Airmen like you. ■

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AIR POWER IN URBAN OPERATIONS - FALLUJAH

By Lieutenant Colonel Ralf Korus, DEU A

Introduction

The term Urban Operations evokes images of Stalingrad in 1942, the city of Hue during the North Vietnamese Tet Offensive, and Grozny during the Russian intervention in 1994. Images include levelled buildings, destroyed infrastructure, starving and traumatised people and all the devastating effects caused by ordnance delivered by ground, maritime and air forces. The power of the media can change public opinion by delivering graphic images into our homes and turn tactical victories into strategic defeat. The US faced this situation after Hue; they destroyed the fighting power of the North Vietnamese Army – a tactical victory – but lost most of the public support in their homeland based on shocking images presented via the television, resulting in a strategic defeat. True then as it is now, collateral damage directly influences public perception.[1]

Minimising collateral damage was but one criterion for success in the battle to secure control of Fallujah in November 2004, and Air Power was instrumental in that aim. The Battle for Fallujah offers us valuable lessons in the use of Air Power in Urban Operations.

Fallujah II

Operation *Al Fajr* (which means 'The Dawn'), a joint Coalition-Iraqi offensive led by the US Marine Corps against the Iraqi insurgency stronghold in the city of Fallujah, was the second attempt to regain control over Fallujah. The first attack in April 2004 was stopped after intervention by the Iraqi government based on concerns about collateral damage and the starving population. The insurgents used the time between attacks to strengthen their positions inside the city and to deny Iraqi authorities any attempts to reinstall government control. The city remained one of the hotbeds and strongholds for both the internal and external resistance. As the situation worsened, coalition planning to retake Fallujah began. The main operational objectives included the elimination of a safe haven for insurgents and the restoration of government control in Fallujah. The pre-phase started in early June with the intelligence preparation of the battlefield and air strikes against key insurgent sites. Intelligence Surveillance Reconnaissance (ISR) assets were used to gather intelligence about the networks and key sites; a joint database was populated with vital information as a single tool for all planners. Also in the early stages, Information Operations (Info Ops) shaped the battle space with the air drop of leaflets to announce upcoming events. In early November, coalition forces cordoned the city to interrupt the insurgents' lines of communications. The civilian population was ordered to leave the city to minimise casualties. Every male citizen, who left the town, was separated and searched for weapons. Help was provided to host the displaced population.

'Nearly 800 buildings were mapped and named from ISR data as a prerequisite for pre-planned and on call strikes.'

Commencing 7 November, Multi-National Force-Iraq and Iraqi security forces took over key sites in the West and, on the morning of 8 November, the ground offensive started from the North. The entire operation lasted until 23 December.

The role of Air Power in support of the ground offensive involved the intensive provision of persistent ISR and rapid strikes against targets of opportunity. Air dominance above the area of operations (AOO) was one key factor for success and, although man portable air defence systems, rocket propelled grenades and small arms were available to the insurgents, not a single aircraft was lost. Available literature does not attribute the Coalition success rate to any particular factor; however, it indicates a lack of coordination amongst insurgents to mount an effective defence, the utility of concentrated firepower through Joint coordination, effective self-protection measures, well trained procedures and appropriate rules of engagement to name a few.

The use of a common joint database as a single source of intelligence proved invaluable. Nearly 800 buildings were mapped and named from ISR data (to create a common reference system) as a prerequisite for pre-planned and on-call strikes. The air space above the AOO was layered in several levels and either controlled by the Combined Air Operations Centre or from the ground. In the delivery of fires, first strike success was extremely high based on preplanning and persistent ISR, and follow on attacks could be launched immediately based on the 24/7 availability of strike and ISR assets in the holding areas. Joint coordination was conducted down to the lowest levels to provide joint fires. Fighter pilots familiar with the AOO were integrated into the joint fire teams; Forward Air Controllers used Air Power to the maximum extent and with tremendous success. Air Transport and Air Medical Evacuation (MEDEVAC) also proved extremely valuable during the operation, to insert troops and materiel into hot spots and rapidly transport casualties to aid centres. Within days of commencing operations, Coalition forces regained control of Fallujah, for the most part, and established freedom of movement.

The key Air Power roles that contributed to the successful conduct of operations were air dominance, persistent ISR, rapid and precise strikes, joint planning and execution based on a single database, a layered approach with regard to air space management and a 24/7 support of Air Power. Although not in the public view, non-lethal missions like Air Transport, Air MEDEVAC and Info Ops from air contributed significantly to the success of this offensive.[2] What can Operation *Al Fajr* teach us about future urban operations?

Characteristics of Urban Operations

Global urbanisation is a continuing trend that will accelerate in the coming decades. The world population in 2015 will be 7.2

billion people, up from 6.1 billion in the year 2000, half of which will be urban.[3] Linear battlefields will be the exception; non-linear urban battlefields will be the norm. The AOO will be filled with non-combatants and combatants with no clear distinction between them, and military forces will be mixed with International and Non-governmental organisations and other agencies. Well known terms like Fire Support Coordination Line and Forward Line of Own Troops will lose their importance due to the fragmentation of the battlespace. Training to fight in urban centres means adjusting not only to a new lexicon, but to the increased Joint coordination necessary to achieve the greatest effect. The operation must be viewed as a Joint campaign – starting from the initial planning phase up to the final execution.[4]

Ground forces will face asymmetric threats like Improvised Explosive Devices (IEDs), snipers and other ambushes from within the urban maze. Down to the lowest command level you will find a mix of peace keeping, enforcement and war fighting occurring simultaneously. The key challenge will be to locate, identify and engage an adversary without harming innocents and while minimising collateral damage. All Urban Operations need centralised high-level planning, but decentralised execution. An agile Command and Control (C2) structure will be necessary to respond to such threats and situations, with commanders at the lowest level provided with accurate information to enhance their situational awareness. Airborne ISR sensors and communication relays are essential to keep the common database of information current and accessible to everyone contributing to the fight.

The 'CNN effect' has to be considered at every planning stage. All casualties and collateral damage receive public attention that influences the key message. Tactical misbehaviour on a street corner can have a strategic impact at home and abroad. Proactive Public Relations have to be considered as a vital part of operational planning, to deliver honest and accurate information to support the operation. It informs and influences the local population - often our key target audience - opponents and our own public opinion.

Final thoughts on the role of Air Power

The classic role of Air Power in Urban Operations has been to deliver ordnance from the air to prepare the battlefield for ground forces and for logistical support. Historically, delivering fires from the air was done sequentially, not simultaneously. Today, Joint fires are coordinated from the ground concurrent with other operations ongoing in the area. Some of these other operations may involve the other pillars in the diplomatic, informational, military, and economic environment, including international or non-governmental organisations, which reinforce the need for the centralised planning of Air Power within a joint construct.

The role of Air Power today has changed dramatically from solely lethal tasks to a fusion of lethal and non-lethal tasks. Especially ISR, C2, Air Transport and Air MEDEVAC play a dominant role in the air inventories of the Alliance nations. Technical developments with future aircraft such as the Joint Strike Fighter will further increase the capabilities of airborne assets; a good example today is the use of fighter aircraft targeting pods, to acquire ISR information through the means of Pod Intelligence, or 'PODINT'.[5]

Better precise guided weapons – both lethal and non-lethal - improved situational awareness tools, new sensors to see inside buildings or underground, the ability to distinguish between refugees and combatants, and improved sensors to detect snipers and IEDs all must be acquired. A common recognised picture has to be the norm for all components at all levels. The use of mini-unmanned aerial vehicles at the tactical up to the strategic level and all ISR assets have to be integrated into a system, which can provide the chain of command the necessary information. Suitable communication means and the right C2 relationships have to support this issue.

Regardless of the Joint operation's success during *Al Fajr*, Joint training still needs further improvements. Due to the fact that most future operations will be coalition driven, SOPs and other processes have to be standardised across the Alliance to reflect the Joint perspective of operations. Operation *Al Fajr* demonstrated the potency of Joint effects and the vital contribution that Air Power can make to a successful outcome. ■

Endnotes:

1. Combat Studies Institute, Command & General Staff College, Urban Operations: An Historical Casebook, 02 Oct 2002, Fort Leavenworth, Kansas.
2. Grant, Rebecca, 'The Fallujah Model,' Air Force Magazine online, Volume 88, No. 2 (February 2005): http://www.afa.org/magazine/feb2005/0205fallujah.asp
3. Kemper, Todd G., 'Aviation Urban Operations: Are we training like we fight?' Air War College, Maxwell Paper No. 33, Air University Press, Maxwell Air Force Base, Alabama, September 2004
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Command and Control of NATO Special Operations Aviation in Complex Environments

By Mr Richard Newton

The *Labours of Hercules* is a classic tale of ancient Greece's greatest hero performing 12 seemingly impossible tasks. Most of the tasks have since been forgotten - killing the Hydra, capturing Cerberus - the 3-headed dog guarding Hades, and cleaning the Augean stables, but the metaphor lives on. A 'Herculean task' is one that is so difficult as to defy a simple and prompt solution such as securing air support for special operations during out-of-area operations when faced with a command and control (C2) structure that defies understanding. Modern day 'Hercules,' those special operations air liaisons and staff officers responsible for securing air support for the ground and maritime special operations forces (SOF), face a challenge as daunting as the hero of legend. Like the labours the original Hercules faced, the situation is not as dismal as it seems-with a little creativity this seemingly insurmountable challenge can be overcome.

Challenges facing Special Ops Aviation

C2 of NATO Special Operations Aviation (NSOA) at home or during exercises is rarely an issue – nations control their special operations air and aviation unilaterally and only accept missions their air units are equipped for and qualified to do. Exercises are usually scripted to ensure success and any specialised air and aviation support requirements outside organic capability are pre-arranged. The Herculean task facing NATO's SOF during out-of-area operations, though, is ensuring sufficient, appropriate air and aviation capability to meet its air mobility, intelligence, surveillance, target acquisition, and reconnaissance (ISTAR), resupply, and fire support requirements.

Like Hercules, NATO SOF faces a multi-dimensional challenge. First, interoperability of special operations aircraft within the Alliance is complicated by the range of capabilities and the lack of common tactics, techniques, and procedures (TTPs). Second, political considerations dominate C2 of NSOA – usually to the detriment of operational employment considerations. As the member nations have developed their SOF, and the Alliance has transformed its ability to organize and plan SOF employment, NATO special operations aviation has struggled to meet the competing demands of NATO operations, multinational operations, and unilateral (national) operations. Solving this latest labour of Hercules, providing capable, responsive, dedicated air and aviation support will require multi-dimensional problem-solving, innovative concepts, and willingness to compromise, just as the Hercules had to do when faced with the original labours.

Member nations have had very capable SOF for decades. Some are quite well developed,

with significant expeditionary capabilities, joint organisational structures, and doctrine and TTPs that facilitate joint and multi-national operations. Others, however, are still in the early evolutionary stages of joint special operations. And, for most of the Alliance, special operations air and aviation elements are the least mature of their national SOF.

Establishing Standards

It is a fact that while NATO defines special air operations, it has not agreed upon minimum standards that characterise special operations air and aviation capabilities. Notwithstanding, the significant investments a few member nations have made to develop and sustain a highly capable, technologically sophisticated, organic special operations air and aviation capability, it is a safe generalization to say that most NATO nations have not invested in the tactics, training, crews, organizations, or equipment needed to perform the most difficult and complex special air operations.[1] Sadly, this fact is a source of friction among the member nations.

Initial discussions, among NATO's special operations airmen, aimed at establishing a minimum standard for NSOA, divided into two distinct camps—those who felt the minimum standard should be defined in terms of high-end, complex aircraft and the others whose position was to define special operations aviation in terms of higher aircrew performance standards regardless of aircraft.[2]

The good news is that both camps agreed that special operations aviation must have as its first priority a special operations 'mindset,' the notion that NSOA's priority was supporting the special operations ground and maritime forces throughout the depth and breadth of the battlespace. The only real point of contention was how the member nations might achieve a national special operations aviation capability in the face of political and fiscal realities.

While it will be admittedly difficult to define the minimum standards for special operations aviation capabilities in the consensus driven environment that is NATO, it is not an insurmountable problem. The nations have taken on this issue and the outlook is optimistic. Once minimum capability standards are established for fixed wing and rotary wing special operations aviation, planning for out-of-area operations, requests for force contributions, and force employment becomes relatively simple. Deployed NATO SOF component commanders and staffs will soon be able to access a capabilities database to match appropriate available NSOA resources to the mission tasks at hand. Such a capabilities database will also make deployment planning, force contributions, and mission planning simpler by allowing SOF component commands to request capabilities without specifying airframes.[3] Coordinating for appropriate air mobility, ISTAR, and fire support to special operations task units would be easy except that air liaisons and air staff officers must face a labyrinthine C2 structure. Solving that extremely complicated puzzle, in order to secure the air support that NATO special operations task units need, is the Herculean task facing NATO SOF today.

Command & Control

The NATO School teaches a fairly straightforward, doctrinally-based approach to special operations C2 at the operational level. Recognising that doctrine is a collection of fundamental principles, which guide the actions of military forces towards a common objective, is the starting point for operational design.[4] Commanders determine the C2 structure to best achieve campaign objectives and meet the political and strategic constraints of the operation at hand. Political and strategic realities are the source of the C2 puzzle facing NATO's special operations airmen.

The task facing NATO's SOF is ensuring sufficient appropriate air and aviation capability.

The successful planning, integration, and employment of joint SOF at the tactical level is made relatively easy by the organic and direct support relationships established by nations among their own ground, maritime, and aviation SOF. Planning and integration gets complex at the operational level when nations, joint commands, and other organizations all converge, with their competing, complementary, and unilateral requirements. All must co-exist in the same battlespace and all must synchronize goals, objectives, and operations in time, space, and purpose. The Herculean labour facing NATO's special operations airmen is unscrambling the complex environment that awaits them when they arrive in theatre.

NATO Special Operations Policy advocates a combined joint special operations air command (CJSOAC) as a headquarters subordinate to the combined joint force special operations component command (CJFSOCC) to plan, task, and control the joint special air operations of more than one special operations air element.[5] If formed, a CJSOAC facilitates the command, control, planning, and employment of all special operations and conventional aircraft organic to or in direct support of SOF in theatre. The CJSOAC becomes especially valuable when it is necessary to co-ordinate air support among different special operations task groups (SOTGs) or from the conventional forces. Unfortunately, there is no NATO CJSOAC in the special operations component of the International Security Assistance Force (ISAF) mission in Afghanistan. Any special operations aviation in the theatre is assigned to national task groups or to the American-led, Combined Joint Special Operations Task Force (CJSOTF) Afghanistan.

Some NATO SOTGs deploying to Afghanistan have organic, national special operations and/or conventional aviation support assigned. Other SOTGs, however, deploy without air support. These 'flightless' SOTGs deploy into theatre with air liaison or air staff officers charged with requesting, co-ordinating, and planning air support for their national ground SOF teams upon receipt of a mission. Without organic or direct air support, successful air liaisons support their ground teams by securing air support from the conventional components of ISAF, other SOTGs, CJSOTF Afghanistan, other Regional Commands, or contracting with civilian providers. This makes for a very complex, confusing, and unnecessarily difficult air support environment for special operations.

Once minimum capability standards are established, planning becomes relatively simple.

Applying Doctrine

Were Hercules alive and serving as an air liaison today, he might solve this latest labour by reorganising ISAF to apply the doctrine – putting the organisation in place designed to work through the complexity of limited air support for NATO's SOF. Creating a NATO CJSOAC in theatre, a single special operations air manager, to plan, task, control, and integrate air support for all SOF in the theatre, rather than individual air liaisons from each national SOTG competing with each other to secure air support for their national task groups would be a great start. Air liaisons would still be necessary, but they would represent their SOTGs' to the CJSOAC instead of all the different potential providers of air support. The CJSOAC would be staffed by special operations airmen serving as staff officers. Their role is to ensure all SOTGs receive the air mobility, ISTAR, resupply, and fire support they need in line with the priority established by the CJFSOCC. SOTGs with organic air capabilities should retain control of their national assets - but the CJSOAC would become a clearinghouse for air support between SOTGs and between the CJFSOCC and the other components with air and aviation capabilities.

Special operations aviation spans the gamut of capabilities, from the most complex, technologically sophisticated airplanes and helicopters equipped to fly into medium to high threat environments to conventional aircraft assigned in

direct support of a SOTG for the duration of an operation. Both capabilities are needed by the CJFSOCC. The CJSOAC ensures the correct assets are paired against appropriate assigned tasks, i.e., US MC-130H Combat Talon II airplanes would be saved for specialised airlift missions into medium to high threat environments, no matter which nation provided the special operations teams in the back, and the routine administrative or logistics airlift missions in support of US troops would be provided by other, less capable, less technologically sophisticated airlifters from whichever country offers the capability to the CJFSOCC.

The second thing NATO special operations aviation might do is take a lesson from the Americans and create a standing special operations liaison element (SOLE), the CJFSOCC's liaison to the air component commander. The NATO Special Operations Co-ordination Centre (NSCC) is an appropriate parent organization for a NATO SOLE. The commander of US Special Operations Command Europe (SOCEUR) has a four-person liaison element embedded in the US Air Force Europe air operations centre to represent his interests during routine operations and as a special staff section when deployed in support of US operations. NATO's Allied Air Component Command Headquarters (CC-Air) Ramstein does not have a special operations branch, although there are special operations airmen serving on that staff in conventional Air Force billets. It is a logical evolution for NSCC to create a SOLE at CC-Air Ramstein, providing day-to-day presence in NATO's air component command planning the air war for ISAF. The NSCC SOLE could surge for exercises, planning efforts, and deployments by adding augmentees from other NATO nations – just as the SOCEUR SOLE does at present. The fact that the commander of SOCEUR is dual-hatted as the Commander of the NSCC ought to facilitate this course of action.

Organic and direct support relationships are essential for special operations forces.

Solving this latest labour of Hercules need not be difficult. Overcoming the challenging air support C2 structure in ISAF that NATO special operations aviation must deal with requires the CJSOAC. The CJSOAC would be responsible for ensuring the ground and maritime teams have all the air support – air mobility, aerial resupply, ISTAR, aerial fire support, personnel recovery, and quick reaction force – needed to ensure mission success.

The first step is an ISAF CJSOAC to relieve the national air liaisons from having to learn how to solve the labyrinthine puzzle that defines air support for NATO SOF in Afghanistan. This could be an immediate change and is likely to yield significant positive results rather quickly. Secondly, the NSCC should ensure they have sufficient special operations airmen on its staff and in a SOLE at CC-Air Ramstein. The SOLE will ensure that future air component campaign planning and operational-level planning incorporate appropriate special air operations into their processes. These are easy fixes, but they would go a long way to solving the present Herculean problem of planning, tasking, integrating, and controlling special air operations in the very complex environment that is ISAF. ■

Endnotes:

1. Some nations, like the US, UK, France, and Italy have made significant investments in developing and sustaining very capable, technologically sophisticated fixed wing and rotary wing aircraft, dedicated special operations air and aviation squadrons, and specially selected airmen trained to a higher standard and emboldened with a special operations air-mindedness. Others, however, do not have dedicated special operations aviation or air assets and must rely on the conventional force or other coalition partners for special operations air support.

2. The first-ever NATO SOF Aviation Conference was held at RAF Halton, UK, 12-13 Sept 2006. This discussion of minimum standards for NATO special operations aviation capabilities was one of the major sources of discussion among the 13 nations and 3 NATO joint organisations represented.

3. Currently, the minimum capability for designation as SOA in NATO is considered so high that only a few member nations can meet the requirement. The fact that ISAF has no special operations aviation assigned demonstrates the consequence of too high a standard – the nations cannot contribute what they do not have. Once the capabilities database is developed and populated, the range of SOA capabilities within NATO then becomes an alliance strength. Not every special operations mission requires technologically sophisticated aircraft. Understanding the range of capabilities available to a deployed SOF component helps air planners pair appropriate SOA resources with missions.

4. AAP-6, *NATO Glossary of Terms and Definitions*, North Atlantic Treaty Organisation NATO Standardisation Agency, 2006, pg 77.

5. MC 437/1, *Special Operations Policy*, North Atlantic Military Committee, North Atlantic Treaty Organisation, 14 Jun 05, pg 7.

Air Power in International Security

By Lieutenant Colonel Doctor Maciej Marszałek, POL AF

The 1990s brought about not only the fall of communism in Europe and the end of the Cold War, but also many conflicts of a complexity not previously encountered. As Samuel P. Huntington noted, almost half of the 48 conflicts in 1993 were waged between groups belonging to different civilisations.[1] There was a striking contrast then between the low number of wars between countries and the high number of civil wars resulting from countries' unstable internal situations.[2] In many of them, genocide was committed, which international security experts recognised as the 20th century's most repulsive phenomenon. Unfortunately, the intensity of these conflicts and their complex character explicitly showed the lack of UN peacekeeping forces' operational capabilities and necessitated more active engagement by NATO and US armed forces. From political and military perspectives, these types of conflicts seem to pose a much greater challenge to multinational intervention forces than classic warfare between states.

Air Power as a Crisis Solving Instrument

Operations conducted in the 1990s and early 21st century have shown that Air Power is a dominant military component in crisis response. Moreover, Air Power has enabled the implementation of a minimum risk military strategy. Its precision, low sensitivity to the military activities of warring parties and extensive space capabilities allowed interventions where ground operations would be exceptionally difficult and would threaten huge friendly losses. Therefore, the thesis that Air Power in crisis response combat operations has mainly been used to enforce political decisions seems justified. NATO Operations *Deliberate Force* in 1995 and *Allied Force* in 1999 both brought an end to armed fighting and the warring sides to peace negotiations. Also, Air Power played a significant role in Operations *Enduring Freedom* and *Iraqi Freedom*, although in both these cases it has proved easier to finish the war than to implement permanent peace solutions.

> '... the role of Air Power has changed to reflect the changing interests of societies and the growing capabilities of Air Power itself.'

Analysis of the above operations militates towards a view that the role of Air Power has changed to reflect the changing interests of societies and the growing capabilities of Air Power itself. The main driver of any progress is the human needs, which are derived from different crisis situations. The impetus to fulfil these needs leads to several fundamental qualitative changes in societies' productive forces, particularly in such specific organisations as armed forces and their components. The most significant indicator of such change was the projection of Air Power in crisis response operations to relieve human suffering. Based on this success, it is likely that Air Power will be asked to perform even more difficult tasks in future crisis response operations.

Asymmetric Conflicts versus Air Power in Crisis Response

Operations in Iraq and Afghanistan have convinced theoreticians and practitioners that keeping order by intervention forces on occupied territories is a much more difficult task than defeating the enemy.[3] Communities' multi-ethnic character and resulting animosities favour continuing fighting. For example, specific factions in Iraq and Afghanistan, instead of joining the peaceful reconstruction of the country, wage insurgent fighting and/or mount terrorist attacks. The objects of these attacks are not only international stabilisation forces, but also local political opponents. Moreover, insurgents completely disregard the human losses they inflict upon the civilian population.

The mission to keep internal order on the ground is generally assigned to the land forces component, usually supported by air and naval forces, other military and police formations, civil governmental, non-governmental and humanitarian organisations. Maintaining public law and order, the most crucial element of peace making operations, has become a very difficult and dangerous mission for peacemakers.[4] Military intervention potentially serves to consolidate peace, create an atmosphere of cooperation and

Photo courtesy of Paul Johnson, airshows.org.uk

understanding and also to support an economic reconstruction of the country. Military activities can include reconstructing local infrastructure, reforming governmental structures and/or helping recreate them, as well as training local armed and police forces to perform tasks connected with defending the territory against internal and external threats.[5] However, in Iraq and Afghanistan, discrepancies appeared between theory and practice. After the end of conventional warfare, an escalation of armed fighting occurred, this time irregular and featuring extreme cruelty and simultaneously showing the shortfalls of stabilisation forces.

H. Münkler evaluated this situation aptly stating that 'the United States experienced for the first time in Vietnam how powerless military machines could be to asymmetric strategies when, despite its significant military advantage, it was not able to deal the enemy using insurgent strategy a decisive blow.'[6] The drive to solve such complex crises in Iraq and Afghanistan, whilst seeking to minimise our own losses, necessitates that we search for the most appropriate methods to unleash Air Power's combat potential.

The problem of effective use of Air Power in such specific operations is challenging from both military and political perspectives. A clear doctrinal gap in the area of irregular warfare exists and NATO armed forces are inadequately prepared to perform operations against insurgents and terrorists. A thorough analysis of earlier asymmetric conflicts may have to be remade. Interesting conclusions concerning the use of Air Power against irregular forces are presented by James S. Corum and Wray R. Johnson.[7]

Air Power Functions in Stabilisation Operations

Past counterinsurgency operations indicate that the primary role of air forces should be as a supporting element to land forces and civil organisations. The main Air Power effort will be focused on reconnaissance, surveillance and intelligence operations as well as airlift, medical evacuation and close air support. Psychological operations should also be considered. We can share the opinion of the authors of 'Air Power in the New Counterinsurgency Era...' that in counterinsurgency operations

'Operations in Iraq and Afghanistan have convinced theoreticians and practitioners that keeping order by intervention forces on occupied territories is a much more difficult task than defeating the enemy.'

the effects of partnership of all forces engaged in an operation is much more crucial than defining the 'supported – supporting' relations.[8] Success in these operations requires unity of effort among all participating governmental bodies that provide assistance in political, economic, intelligence and legal areas as well as multinational task forces.

In order to fulfil its part in this process, Air Power requires appropriate concepts of operation within the capabilities of existing air and space platforms. The simultaneous use of modern air reconnaissance assets and combat aircraft to provide land forces with combat support could be a solution. The Air Power effort should be concentrated on supporting land forces by providing them with reliable information on time, freedom of movement in their area of operation and protection. Independent air operations may be concentrated on border monitoring and cutting off insurgent and/or terrorist groups from their sources of weapon supply and other resources.

Conclusion

The refusal of local factions to cooperate in stabilisation operations has changed the character and intensity of irregular warfare, creating a higher risk for engaged international forces and simultaneously prolonging the time of these operations. The civil-military dimension of crisis response operations, focused on restoring and keeping law and order in occupied territories, requires close coordination of the activities of all civil organisations and agencies with those of military components, including air. ■

Endnotes:

1. S.P. Huntington, *The Clash of Civilizations and the Remaking of World Order*, Polish Edition Muza SA, Warszawa 2006, p. 38.
2. According to SIPRI, since 1993 all major conflicts have had an intra-state character.
3. Usually it means forcing the enemy to act according to international organisations' expectations who are responsible for providing world security.
4. Peace making includes supporting political, economic, social and other centres/structures oriented on strengthening understanding to solve the conflict.
5. Compare: Allied Joint Publication, *Non-Article 5 Crisis Response Operations*, NAS, Brussels 2005.
6. H. Műnkler, Die neuen Kriege, Polish Edition, Wydawnictwo WAM, Kraków 2004, p. 40.
7. J. S. Corum, W.R. Johnson, *Airpower in Small Wars. Fighting Insurgents and Terrorists*, University Press of Kansas, Kansas 2003.
8. A.J. Vick, A. Grisson, W. Rosenau, B. Grill, K.P. Mueller, *Air Power in the New Counterinsurgency Era. The Strategic Importance of USAF Advisory and Assistance Missions*, RAND, Santa Monica 2006, p. 111.

Space Support to Security and Stability Operations

Canada's RADARSAT-2
Synthetic Aperture Radar Satellite.

By Major Thomas 'Solo' Single, USA AF

Today's modern military capability is increasingly dependent on space systems to enable expeditionary, net-centric operations. Savvy commanders will often ask for space personnel and support from space, but are not sure exactly what is needed or how space can support asymmetric security and stability operations.

What are Space Operations?

Operating in space has several advantages.[1] There are no over-flight restrictions for satellites; therefore, observation of territory denied to air, land, or sea assets becomes possible. Satellites can provide global coverage and can react quickly. Space capabilities were initially developed to provide arms control verification, indications and warning of air or ballistic missile attack and eventually to provide communications capability. Today, however, the role of space operations has greatly expanded.

Space capabilities have become a critical force enabler. Space operations can be divided into four different mission areas: force enhancement, space support, force application and space control.[2] The space control mission consists of three sub-mission areas, space situational awareness, offensive counterspace and defensive counterspace operations. Space control is critical in today's security environment and, arguably, has not been adequately addressed by NATO, but that is beyond the scope of this paper. All the mission areas are important; however, this article will focus on force enhancement because it provides direct support to the warfighter. Force enhancement includes position, navigation and timing (PNT) services, ballistic missile warning, satellite communications, remote sensing, and other capabilities. This paper is limited to discussion of only a few of these capabilities.

Security and Stability Operations

The primary focus of security and stability operations may be helping a severely stressed government to avoid failure, to recover from a devastating natural disaster or to assist an emerging government to build a new domestic order following internal collapse or defeat in war.[3] A stability phase is required when there is no fully functional (or limited), legitimate

civil governing authority present.[4] The goal should be the viability of the civil authority and its provision of essential services to people in the region while promoting rule of law, safety of civilians and a stable economy.[5]

In Afghanistan, NATO has forces assigned to the International Security Assistance Force (ISAF) and Provincial Reconstruction Teams (PRTs) to help the government facilitate the development of security by establishing relationships with local authorities, supporting security sector reform activities, and helping facilitate the reconstruction effort in the provinces.[6] So how can space support the ISAF and PRT operations or more generally, security and stability operations?

Space Support to Security and Stability Operations

Space supports information and decision superiority. Space capabilities can be used in urban operations and precision engagement to fight terrorism, to conduct major combat operations, asymmetric warfare, and for security and stability operations. Space enables an effects based approach to operations and net-centric capability. It is important to understand some of the specific capabilities in order to integrate space seamlessly into planning and operations, across the spectrum of conflict.

The first force enhancement capability is navigation and timing services. There are many applications for PNT services from space. The Global Positioning System (GPS) is used for navigation and positioning by military, civil and commercial applications. Precise position coordinates can be used for civil engineering, farming, mapping, tracking forces etc. However, the timing signal is just as important. The timing signal can be used to synchronize networks, communications equipment, electrical power grids, banking, cell phone towers and phones, encryption equipment and many other applications. Today, military and civilian capabilities are becoming increasingly reliant upon PNT services from space.

Secondly, missile warning and space surveillance is a critical, force enhancement mission. Strategic and theater ballistic missile and air warning can be shared to provide the notice of impending attacks. These systems can also provide treaty compliance verification. Space surveillance tracks multiple space vehicles and the thousands of pieces of space debris, protects space systems, provides situational awareness and space control capabilities.

Thirdly, satellite communications (SATCOM) provide communications to military forces and government agencies alike. In a forward deployed location, track data, intelligence information, internet services, email, phone calls, are all sent via SATCOM. Moreover, unmanned aerial vehicles utilize SATCOM for their command and data links. Limited bandwidth and insufficient terminals will always be an issue of concern here. Additionally, satellite phones such as Iridium, Globalstar and Thuraya are widely available, inexpensive, and provide world-wide coverage in austere locations, enabling the necessary ground command

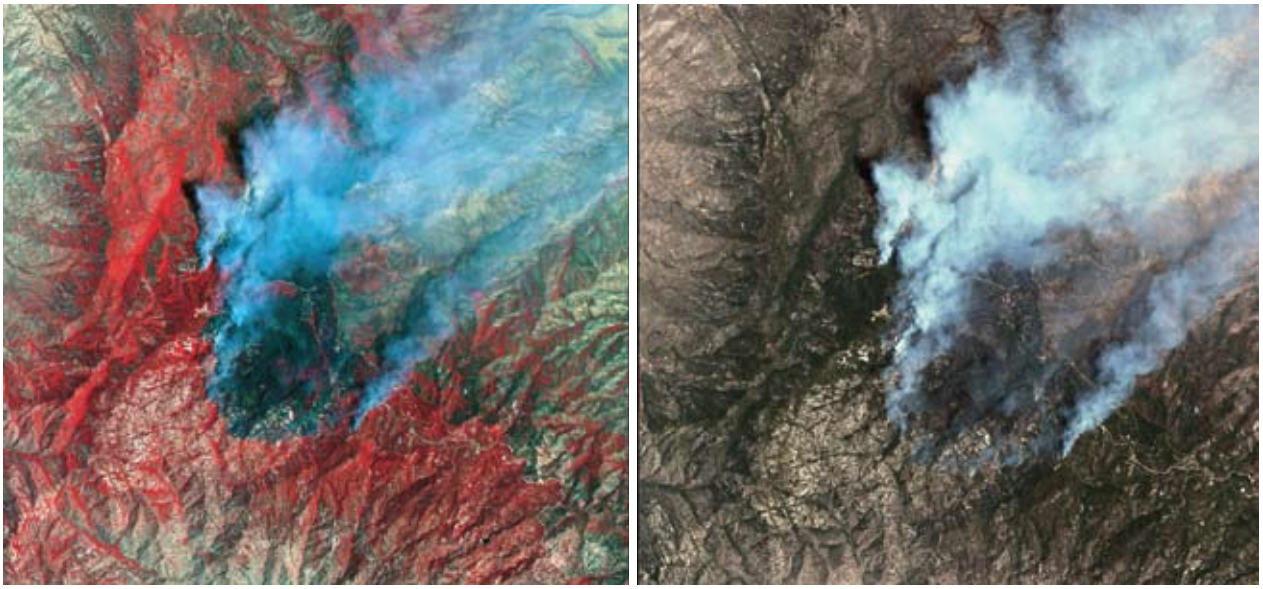


Figure 1 - The left side is an infrared multispectral image of a southern Arizona forest fire, which accentuates vegetated areas in red, with the burn region clearly distinguished in green. The second is a natural colour multispectral image of the same area.

Figure 2 - New Orleans before and after Hurricane Katrina.

and control communications infrastructure for asymmetric and security operations.

Fourthly, through remote sensing, military, civil and commercial satellites provide weather data, imagery of the terrestrial and space environments and cosmic effects. Weather information, accessible through military or internet channels, can be used for weather forecasting and planning operations. Remote sensing also includes surveillance and reconnaissance missions, many of which are classified. Signals intelligence satellites can detect transmissions from radios, radars and other electronic broadcast systems. Other sensing capabilities include imagery intelligence, which are vital to any operation.

Besides the obvious military utility of imagery (troop movement, terrain analysis, flight planning, etc.), oil, gas and mining companies use imagery for well site location, facilities planning and management, monitoring of pipelines and general mapping. High resolution imagery is used in land planning of facilities such as airports, dams, site locations for housing developments, schools and sports facilities and new cell phone tower sites. Commercial imagery can also be used for vegetation analysis (crop/forest health), counter narcotics operations, refugee monitoring, border control and the management of ports, harbors and other facilities.

Commercial satellite companies offer optical and radar imagery through web-based portals. The United States Air Force has a deployable system called Eagle Vision, which is capable of directly down linking commercial imagery from a deployed location. Figure 2 is an example of the type of product available from the Hurricane Katrina operation in the US. Commercial imagery is easily obtained, extremely useful, unclassified and should be utilized for security and stability operations.

Satellite imagery utilizing Synthetic Aperture Radar, can be used in a technique known as coherent change detection (CCD). To detect whether or not a change has occurred, two images are taken of the same scene, but at different times or satellite passes. Where a change has not occurred between passes, the pixels remain correlated; if a change has occurred, the pixels are uncorrelated.[7] In Figure 3 the blue spots show where change has occurred (destroyed bunkers).

Blue Force Tracking (BFT) is a system that links satellites, sensors, communications devices, vehicles, aircraft and weapons in a seamless digital network.[8] NATO is developing a Multi-National GPS-based friendly force tracking system, which will support the monitoring, command and control of deployed forces by identifying friendly versus enemy forces. NATO will have the ability to identify where its personnel are located at all times and identify other Multi-National forces in routine and operational situations.[9] CCD and BFT can be used to minimize the possibility of fratricide and collateral damage. For example, in combat operations where a precision strike is required, and no loss of civilian life is mandatory, CCD can be used to determine a pattern of life around a target, and coupled with current intelligence and expert weaponeering, greatly reduce the probability of loss of life.

In summary, AJP 3.3 states that space forces play a significant role in all phases of operations. Space can characterize threats and identify strengths, weaknesses, and vulnerabilities. Space support is often critical to decision making and can provide global situational awareness and as a crisis escalates, it can provide information to help leaders appraise the situation and implement appropriate measures to defuse or respond. Additionally, intelligence data can be provided to one or both sides in a potential conflict to reduce tensions. If these efforts fail, space can directly support the deployment, employment, and redeployment of military forces and the conduct of combat or security operations.[10]

Recommendations

The importance of satellites cannot be underestimated. Space is a critical enabler of expeditionary, net-centric military operations and can provide a transformational capability for European security. However, the space environment is changing: Iraq and Iran have used jammers to disrupt GPS and satellite communications. On 11 January 2007, the Chinese launched a kinetic kill anti satellite (ASAT) weapon and destroyed an aging Chinese weather satellite in low earth orbit.[11] Although ASAT weapons are not new, the capability demonstrated by China clearly demonstrates that times are changing and NATO must enhance their thinking about space operations. The following 4 recommendations would help to transform NATO space operations:

Governance - First, there is a need to provide proper governance for space. A NATO Space Policy and Strategy should be established and implemented as soon as possible. Once a Space Strategy is available, space capability and system requirements for the Alliance can be established.

Personnel - Next, NATO should place more significance on space operations and begin space operations transformation by assigning seasoned space operators to key positions in the Alliance. NATO requires a small cadre of space planners and integrators whose specialist skills can be developed for the future.

Organization - Thirdly, a NATO committee to work space operations issues and to act as the focal point for all NATO space concerns is needed. Space is multi-disciplinary and integrated among all operations and systems. Overall management of space operations is essential. Additionally, NATO should create a space operations center that fuses national, civil and commercial space capabilities.

Tactical and Operational Level Integration - Lastly, NATO must fully utilize and integrate space capabilities and effects at the tactical and operational levels of war. At the tactical level, commercial imagery, force tracking and other programs must be utilized further. At the operational level, planning and integration to establish space superiority and conduct space control operations must be accomplished. Doctrine and tactics, techniques and procedures must be developed. Training and exercises should include space operations scenarios and inputs from space based effects.

Conclusion

Space capabilities are integral to military capabilities and can influence operations throughout the spectrum of conflict, from shaping operations to enabling civil authorities in security and stability operations. It is important to integrate space capabilities fully and seamlessly into all phases of operations. The security situation has changed and transformation is underway in NATO. Space operations should be part of that transformation. Several steps can be taken to better enable expeditionary, net-centric operations. The time to begin those changes is now. ■

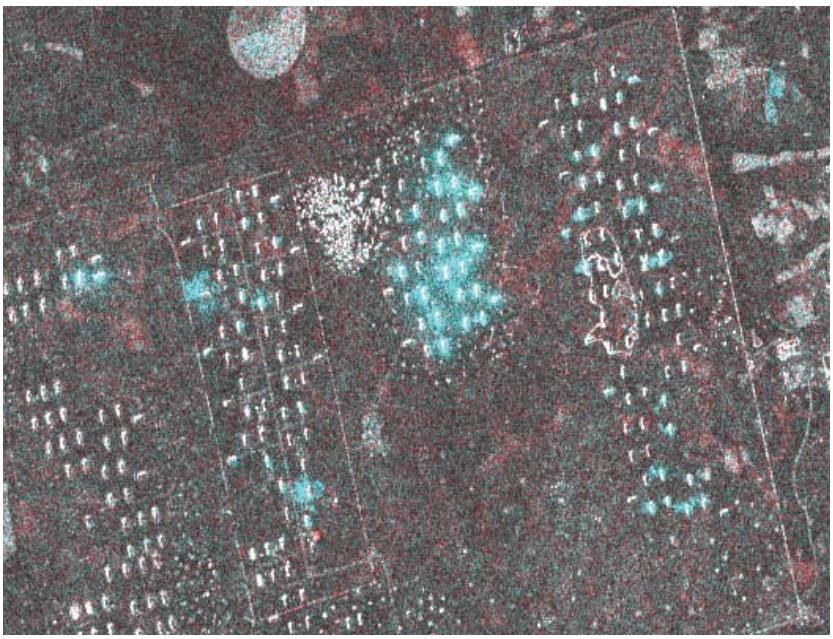


Figure 3 - Multiview coherent change detection image showing damage to a storage depot.

Endnotes:

1. Allied Joint Publication (AJP) 3.3 (Change 1) Joint Air and Space Operations Doctrine, Chapter 6. May 2002.
2. US Air Force Doctrine Document (AFDD) 2-2 Space Operations and AJP 3.3
3. Military Support to Stabilization, Security, Transition and Reconstruction Operations Joint Operating Concept (MSSSTR), US Joint Forces Command, pg 32.
4. US Joint Publication 5-0, Joint Operation Planing
5. Ibid., pg IV-37
6. NATO Handbook 2006, Chapter 16 NATO's Role in Afghanistan, pg 155-156
7. Synthetic Aperture Radar Applications, Sandia National Laboratories Website: http://www.sandia.gov/RADAR/sarapps.html
8. 'Bigger Role for Blue Force Tracking.' Military Information Technology, June 17, 2004. http://www.military-information-technology.com/article.cfm?DocID=504
9. 'NATO Awards GPS-Based Force Tracking System Contract' Jul 14, 2006 http://www.gpsdaily.com/reports/NATO_Awards_GPS_Based_Force_Tracking_System_Contract_999.html
10. AJP 3.3. pg 6.1-6.3
11. Celestrak Events: Chinese ASAT Test, available at http://celestrak.com/events/asat.asp

NEWS

On 18 September 2007, the JAPCC bids a fond farewell to Lieutenant General Hans-Joachim Schubert, and welcomes Lieutenant General Friedrich Ploeger as the next Executive Director of the JAPCC. The JAPCC community would like to thank General Schubert for his leadership and wish him and his family the best in their future endeavours.

JAPCC and EAG Sign LOA

The JAPCC and the European Air Group (EAG) recently signed a Letter of Agreement (LOA) to look for ways to develop a more synergistic way of doing business together. While the JAPCC is focused at the strategic and operational level, the EAG concentrates their efforts at the tactical level.

Both organisations share a common interest, to advance and strengthen Air Power capabilities amongst the Alliance nations, so it is entirely logical to monitor each other's programme of work for overlap in focus areas. Moreover, the defined separation in the scope of the JAPCC's focus on strategic and operational levels and the EAG's focus on the tactical provides a solid basis for cooperation and coordination on different, necessary levels of work on the same basic topics. In fact, there are several areas where JAPCC and EAG are already working in close coordination. The initial projects for cooperation include: Force Protection, Deployable Multinational Air Wing, UAV/UAS Issues, Air Land Operations Training and Exercises, and the C4ISTAR Roadmap.

NATO Force Protection Doctrine for Air Operations

Following the March 2007 Air Forum, the JAPCC sent to the Military Committee Air Standardisation Board the proposal for NATO Force Protection Doctrine for Air Operations. The NATO Standardisation Agency has forwarded the First Study Draft of the NATO Force Protection Doctrine for Air Operations to the Nations to seek a view on whether to proceed or modify the proposal. Assuming the Nations are supportive, the JAPCC will work with the Nations and NATO Command Structure to refine the doctrine for eventual ratification.

JAPCC Support to the EU Rapid Response Air Initiative

Supported by the German Air Force Air Operations Command, also based in Kalkar (GE), the JAPCC hosted an EU Workshop on the Rapid Response Air Initiative (RRAI) in April this year, at the newly opened JAPCC Conference Centre.

Together with the EAG, the JAPCC has been invited to support the RRAI, using existing products like the Deployable Multinational Air Wing Concept (DMAW – EAG) and the Deployable Airfield Activation Wing (DAAW – JAPCC) concept. In this way, the RRAI provides an excellent opportunity to fully exploit the work and competences of both organisations in a harmonised and coherent manner. It also marks the first occasion where the JAPCC directly supports the EU.

The aim of the EU study on the RRAI is to develop a concept for the generation of an effective, credible and coherent rapid response air capability within the framework of the European Headline Goal 2010 (HLG 2010). The RRAI would enable the EU to rapidly deploy an air component to complement EU Battle Groups or operate independently to contribute to an EU-led military Crisis Management Operation (CMO).

Bi-SC Maritime Air Coordination Conference 2007

On November 14th and 15th, the Bi-Strategic Command (Bi-SC) Maritime Air Coordination Conference 2007 will take place near London. COMMAIRNORTHWOOD hosts the Conference on behalf of ACO, while the JAPCC, as SACT Joint Air Power principal advisor, co-hosts this conference on behalf of ACT.

The TOR state that the Conference is to meet annually: in October 2005 it was held at CC-Mar Northwood and in 2006 at the CAOC 2 in Uedem, Germany. This year it will be held at the RAF Museum of Hendon and next year, it is

expected to be held in the new JAPCC Conference Centre in Kalkar, Germany.

The theme of this year's conference is: 'MARAIR recognised as Core Air Power Business.' Among the speakers that have provisionally accepted invitations to brief are Air Vice-Marshal A. Pulford RAF, Air Officer Commanding No. 2 Group, who will deliver a keynote address based on the MACC 07 theme, and Vice Admiral P. Bedet, Royal Netherlands Navy, who will present on Maritime Situational Awareness, from an air perspective. The Conference will also include a number of other highly topical MARAIR related briefs which will stimulate the audience to comment on integration of MARAIR into the Joint Air Battle/TST issues.

Report on Future of Air-to-Air Refuelling

The JAPCC released the Report on Future of Air-to-Air Refuelling (AAR) to NATO in June 2007. The report provides outcomes from the Combat Support Branch's study to answer the questions, 'How is AAR transforming?' and 'How do we want it to transform?'

Several nations will bring new AAR platforms into operations in the near and mid-term future. These aircraft will provide opportunities to combine and interchange roles, and expand interoperability among nations. JAPCC conducted the research to anticipate future challenges and opportunities, and provide alliance and national operators, planners, and commanders a vision of AAR over the next 15 to 20 years. The study examined AAR effects, future AAR resources and requirements, technologies, additional roles for tankers, employment concepts, operating environments, logistics, doctrine, procedures and training.

The report recommends institutionalising efficiency techniques, since even proportionally small savings can yield large absolute savings in resources. Establishment of NATO AAR doctrine, and realistic alliance exercises and training in AAR are also recommended. The full report can be found on the JAPCC website under 'Projects' – 'Enhancing NATO AAR Interoperability.' The CS Branch invites comment and recommendations for follow-on research and implementation strategies from Alliance and national air operations staffs and operators.

Air-to-Air Refuelling Blog – 'AAR Blog'

Following the successful launch in April 2007, of the revised NATO AAR Procedures Manual ATP-56(B), more nations have now requested that details of their tanker and receiver capabilities be included in this document. These national annexes, including non-NATO counties, are included in Part 5 of ATP-56(B). It contains a lot of detailed information which is difficult to sift through quickly; therefore, the JAPCC decided to summarise all the facts on one page, and thus the 'AAR Blog' was produced. It can be found at: http://aarclearances.blogspot.com/.

The AAR Blog merely summarises the tanker and receiver clearances contained in the national annexes. It is intended to provide guidance to AAR planners and operators in matching tankers with receivers. However, like all good things, this one comes with a government warning. The blog is not an authoritative document, it merely repeats information contained in the various national annexes. A final check with the aircraft operating authorities is essential before AAR missions are tasked. Any ideas for improvement, please contact aar@japcc.de.

JAPCC Staff Ride to Berlin, 2-5 May, 2007

In May, JAPCC personnel took part in a 3 day staff visit to study a range of tactical, operational and strategic events centred on Berlin between 1935 up to the present. The purpose was the professional development of the JAPCC staff with emphasis on Air Power.

Supported by Mr Chris Finn from King's College London, military related topics including pre-war US, UK and German bomber doctrine, the Battle for Berlin, the origins of the Cold War, contrasting approaches to UK and German air defence, the Berlin Airlift and Cold War SIGINT were researched. The teams of 2 or 3 prepared well in advance in order to brief the findings at a historical site in Berlin.

The teams visited several historical locations and at the end of each day the teams gathered and Chris summarised the day's events, pointing out the major lessons learned from the past and deriving lessons from history applicable to the JAPCC in its role of facilitating the transformation of Allied Joint Air Power. The visit highlighted the differing viewpoints from the various nations represented at the JAPCC and provided a forum to exchange ideas and to build camaraderie. ■

Biographies

Lieutenant General J.H. (Hans) de Jong completed his initial pilot and officer training in 1976. Since then, he has commanded 322 Squadron and logged over 2,500 flying hours on NF-5, F-104 and F-16 aircraft. From 1985 to 1986, Lieutenant General De Jong attended the Senior Staff Course at the Air Force Staff School. He has served, predominantly, in Plans and Policy appointments in the Headquarters RNLAF and Ministry of Defence in The Hague and the Reaction Forces Air Staff in Kalkar, Germany. In 2002, he became Commander of the RNLAF Tactical Air Force, before his current appointment as Commander, Royal Netherlands Air Force Command.

Brigadier General Guillaume Gelée joined the French Air force in 1978 and began his career as a Mirage F1C pilot in Reims. Following his graduation at the UK Empire Test Pilot School in 1989, he served as a test pilot at Bretigny sur Orge flight test centre. He has been a squadron commander, and served as 'Rafale' program project officer and as the Chief of Plans and Studies Department at the French Air Force Headquarters. Brigadier General Gelée is a graduate of the Defence College (Collège Interarmées de Défense in Paris) and in 2005, he attended the Higher Military Studies course and the Higher National Defence Studies Institute (IHEDN). Following his promotion to Air Brigadier General in September 2006, he was appointed as Director of Strategic Air and Space Studies Center in Paris. Brigadier General Gelée is currently the officier of the Légion d'Honneur and Officier de l'Ordre National du Mérite.

Colonel Dan Lewandowski is Chief Combat Air Branch at the JAPCC. He was one of the first career space operations officers in the USAF. He was the Branch Chief for space and C4ISR programs for the Deputy Under Secretary of the Air Force for International Affairs. In 2002, he took command of the 50th Operations Support Squadron, responsible for 130 personnel and the combat readiness training of over 530 crew personnel, operating over 140 satellites. He has four masters degrees in Strategic Studies, Military Operational Art and Science, Space Systems and Business Administration.

Major General Freek Meulman was born and raised in Eindhoven, the Netherlands. He attended the Royal Netherlands Military Academy from 1975 to 1979. In his early career he held operational assignments in the 5th Netherlands Missile Group in Germany. After that, he completed several courses, including the Netherlands Air War College, Advanced Staff College and studies at the Air University at Maxwell Air Force Base in the United States. He commanded the Netherlands Missile Group 'De Peel' and served in a number of operational and staff appointments. After serving as the Deputy Commander CAOC 2, he became Vice Chief / Deputy Commander-in-Chief of the Royal Netherlands Air Force, before assuming his current appointment as Deputy Commander (Air) of ISAF X, Afghanistan. Major General Meulman is married and has three children. His interests include military history and sports.

Group Captain John Alexander is Chief Combat Service Support at the JAPCC. Commissioned in the RAF Regiment, he served with RAF Rapier units in Germany, Belize and the Falkland Islands; USAF Rapier in the UK; on secondment in Oman; as Adjutant of a Light Armoured Wing in the Gulf 1990-91; in staff appointments at the Central Tactics and Trials Organization, in MOD operational requirements, at the Air Warfare Centre, in the MOD on Iraq WMD counter-proliferation policy and in PJHQ(UK) J3; on operations to disarm Iraq in 2003 and in HQ MNF-I to support the January 2005 Iraqi elections; and he has commanded 37 Squadron RAF Regiment and the Joint Rapier Training Unit. He is a graduate of Newcastle University (BA(Hons) Geography), the Open University (MBA and Postgraduate Diploma in History), the Royal School of Artillery Gunnery Staff Course and the Air Battle Staff Course, and has taught on the Advanced and Higher Command and Staff Courses.

Biographies

Group Captain Leaming joined the Royal Air Force in 1976 and, after officer and pilot training was posted to fly Wessex Support Helicopters in Hong Kong. He qualified as a Helicopter Instructor and later commanded a Wessex Squadron in Cyprus, flying in the Support Helicopter and Search and Rescue roles. Following completion of the Royal Air Force Staff College in 1991, he was promoted to Wing Commander to command a Search and Rescue Helicopter squadron flying Sea King (SH3). Thereafter, following 2 staff tours, he commanded the Royal Air Force Station at St Mawgan, which included command of the Royal Air Force Search and Rescue Helicopter Force, with units based around the coast of the UK. In 2005, he became the Senior Air Advisor to the Head of the Iraqi Air Force in Baghdad. He joined MCC Northwood as Head of Air Plans in January 2006.

Colonel Lee T. Wight is the Director of Staff, United States Senior National Representative and Commander, Air Force Element, Allied Air Component Command Headquarters, Ramstein Air Base, Germany. He received his commission through Officer Training School in 1986 from the University of Oklahoma and has three Master's degrees. A graduate of the USAF Weapons School, he is a command pilot with approximately 500 combat hours and has flown the F-16 and F-117 aircraft. Colonel Wight has been an instructor pilot, and commanded at the squadron, group and wing level. He is a graduate of the NATO Defense College, the School of Advanced Airpower Studies, and Naval Command and Staff College.

Lieutenant Colonel Ralf Korus joined the German Army Air Defence branch in 1978. He graduated from Munich Military University as a business economist and has spent most of his service dealing with air defence at different command levels. In October 2006 he joined JAPCC after serving as the Air Defence Staff Officer at the HQ 1(GE/NL) Corps. Working in the C4ISTAR Branch, he is responsible for airspace control and land related topics.

Colonel Frans Osinga (RNLAF-PhD, University of Leiden) is a qualified jet pilot, serving in various posts on NF-5 and F-16 squadrons. He has also served in the Air Power Studies Department of the Netherlands Defence College as a Director and seconded to the Clingendael Institute of International Relations as senior research fellow. Until July 2007, he was the Joint Air Power Competence Centre's Liaison Officer at Headquarters Supreme Allied Command Transformation. Colonel Osinga has received a doctorate degree from the University of Leiden, and has published and lectured on European defence policy, asymmetric warfare, the Revolution in Military affairs, and coercive strategy.

Lieutenant Colonel Jim Bates joined the Canadian Forces Communications and Electronics Branch in 1986. He commanded telecommunications squadrons at 4 Wing in Cold Lake Alberta and at the Fighter Group/Canadian NORAD Region Headquarters in North Bay Ontario. In 2002 he deployed to Bosnia and Herzegovina as the G6 in support of the Canadian Battle Group in SFOR. Working in the C4ISTAR Branch of JAPCC, he is responsible for deployed communications and information systems. Lt Col Bates is a graduate of the Canadian Forces Command and Staff College in Toronto; he holds a Bachelor of Electrical Engineering and a Masters in Business Administration.

Biographies

Lieutenant Colonel Maciej Marszałek is Assistant Professor at the Faculty of Aviation and Air Defence at National Defence University in Warsaw since 1995. He started his service in the Air Force in 1985 and has held staff positions in the Air Defence Rocket Regiment and the Air Defence Brigade. He holds an Engineering degree form the Higher Officers School of Radio Technology, a Masters degree from the Higher School of Pedagogy and a doctorate degree in Military Sciences from National Defence University. He is the author of books entitled *The Use of NATO Air Forces in the Balkan Conflict 1992 – 1995* and *Selected Aspects of Operations Other than War in NATO Doctrine* and has co-authored several others.

Major Tom Single is a member of the JAPCC C4ISTAR Branch. His operational experience includes ICBM, space and AOC weapon systems. He has combat experience in support of OIF and OEF and has participated in several major exercises as a theatre space operations duty officer. He has a BS in Aerospace Engineering, a MBA and a MS in Space Operations from the Air Force Institute of Technology. In his previous assignment, he was the Chief of Theatre Support at HQ Air Force Space Command. He arrived in Kalkar in March of 2007 and serves as the JAPCC subject matter expert on space operations.

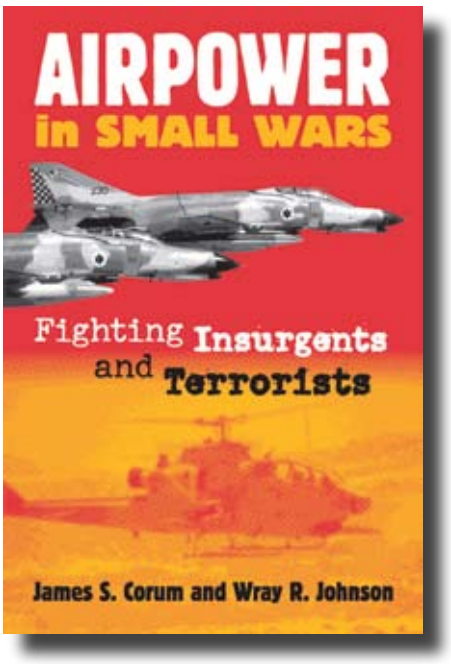
Lieutenant Colonel (ret) Rick Newton teaches special air warfare, command and control, irregular warfare, and campaign planning at the Joint Special Operations University at Hurlburt Field, Florida. He also serves as adjunct faculty at the NATO School in Oberammergau, teaching special operations planning, integration, and targeting. Mr Newton has served as a combat rescue and special operations helicopter pilot in Korea, Florida, Iceland, and New Mexico. He has also been a theatre-level planner at US Special Operations Command and at US Air Force Air Combat Command. Mr Newton is a 1977 graduate of the US Air Force Academy and holds Master of Military Art and Science degrees from the US Army Command and General Staff College and from the US Army School of Advanced Military Studies. He has more than 2500 hours of military and civilian flying time.

Wing Commander Pete York is a VIP transport navigator who arrived at JAPCC in 2005 from CC-Air Izmir, Turkey where he was the Director of Staff. Prior to that, he was CC-Air Izmir's CJFACC Planning Chief and responsible for the implementation of NATO's CJFACC and NRF Concepts. He has experience in planning and execution of the flying schedules for RAF AT, AAR and VIP transport fleets during peacetime routine and crisis operations. He has also been a tutor in the Muharraq Al-Abdullah Command and Staff College in Kuwait.

Major Andreas W. Leibner is a member of the JAPCC Future Capabilities branch. He joined the German Army in 1980 as tank commander and has spent most of his service working with Military Intelligence at different command levels. In 2005 he deployed to Bosnia and Herzegovina as the Commanding Officer of the German National Intelligence Cell. In May 2006 he joined JAPCC after serving as Intelligence Staff Officer at the Bundeswehr Military Intelligence Centre. He is responsible for Intelligence support and serves as the JAPCC subject matter expert on Intelligence.

Book Review

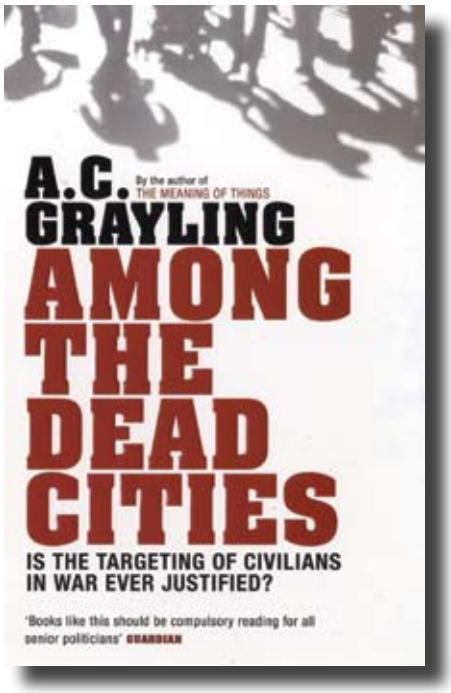
Airpower in Small Wars: Fighting Insurgents and Terrorists.
By James S. Corum and Wray R. Johnson
University Press of Kansas, 2003



For the reader wanting to learn more on the history of air power in irregular warfare *Airpower in Small Wars* is a good place to start, as it covers 27 conflicts since the 1916 US Mexico Expedition. Its historical lessons reinforce many of this Journal's theses: such wars are won politically not militarily; Air Power's role is likely to be supportive in roles like reconnaissance and transport; collateral damage concerns are not new; and the full kinetic effect of Air Power can only be exploited if the adversary concentrates its forces. The book concentrates on people, on enduring lessons, and acknowledges that while technological developments are important, technology will not provide the silver bullet. The authors emphasize the importance of inter-service cooperation, strong leadership and innovation. If the book has a weakness it is that the research is based on the government archives and does not include the views of the guerilla or insurgent.

Review by Group Captain John Alexander, GBR AF

Among the Dead Cities
By A. C. Grayling
Bloomsbury Publishing Plc, 2006



During WW II, the air forces of Britain and the United States carried out a massive bombing offensive against the cities of Germany and Japan, ending with the destruction of Hamburg, Dresden, Tokyo, Hiroshima and Nagasaki. Was the indiscriminate bombing of civilians justifiable militarily, or was it 'in whole or in part morally wrong'? This is the question addressed in *Among the Dead Cities* by A. C. Grayling, a professor of philosophy at the University of London and one of Britain's more prominent and outspoken public intellectuals.

Grayling's study focuses primarily on British bombing and in particular, on Operation *Gomorrah* – the aerial attacks on the German city of Hamburg. He examines the decisions that were made which transformed civilians into legitimate targets and he also looks at the question of who can be held responsible. *Among the Dead Cities* is both a lucid and revealing work of modern history and an investigation of conscience into one of the last remaining controversies of WW II. The Guardian stated 'Books like this should be compulsory reading for all senior politicians.'

Review by Major Andreas Leibner, DEU A

IRIS-T – far-sighted, highly agile and resistant to countermeasures

From the outset, IRIS-T was designed to meet the new requirements of six European Air Forces. IRIS-T has been selected to arm the Eurofighter Typhoon, Tornado, JAS 39 Gripen, F-16 and F-18 aircraft in those countries. Additionally, Austria will equip its Typhoons with IRIS-T Missiles.

Key design features of IRIS-T are:

- **Imaging Infrared Seeker**
- **Target Cueing with Helmet Mounted Sight and Other Sensors**
- **High-Agility Missile, Thrust Vector Controlled**
- **Sidewinder Interoperability**

IRIS-T was developed jointly by Germany, Greece, Italy, Norway, Spain and Sweden with Diehl BGT Defence as industrial prime contractor. IRIS-T is in full-scale series production, and service introduction started on 5 December 2005.

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