



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



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As the Director of the Joint Air Power Competence Centre, I am delighted to introduce the fall edition of the Journal. The Journal of the JAPCC prides itself on expressing Air and Space Power ideas and opinions through a diverse international authorship.

This edition contains submissions from Australia, Germany, Italy, Poland, Spain, the United Kingdom, and the United States. I want to especially thank our contributors, and I hope you feel inspired to further debate the topics inside these pages. Your thoughts and ideas will help shape the future of Air and Space Power.

As the Alliance transitions to a new Air Command and Control structure, matures in Cyber and Space areas, and works to field a Ballistic Missile Defence system, there are clearly no lack of challenges. Meanwhile, national militaries face increasing fiscal constraints. As the overall size of NATO forces diminish, the significance of Air and Space effects increases. Against such an environment, it is as critical as ever to find tangible ways to maximise limited defence budgets. We must be more effective, work closer together, and find ways between nations to complement each other's strengths. This edition explores some of the current hurdles, looks at Space from different perspectives, discusses a fighter consortium concept, and highlights a new Australian capability.

The first article is an interview with the Spanish Air Force Chief of Staff, General José Jiménez Ruiz. General Ruiz provides insight on upcoming Air and Space Power challenges as well as the next step forward in the evolution of Spanish military aviation.

Air Marshal Sir Chris Harper points out Space issues in today's fight. Topography has played an important role in military endeavours as highlighted by Wellington and Napoleon. He suggests that 'Space' is the key high ground today.

Lt General Pasquale Preziosa of the Italian Air Force reminds us, 'Today's seed is tomorrow's tree,' and explains how flight schools are a key component to maintain Air Power effectiveness. Training on the right generation of aircraft augmented by realistic simulation is a balanced approach to achieving future air capability.

The JAPCC Regional Fighter Partnership Team, led by Col Dave Pedersen, discuss an option to share costs across common fighter aircraft capabilities, while still maintaining sovereign command.

Our partners 'down under' introduced a new Airborne Early Warning and Control (AEW&C) capability into the Royal Australian Air Force (RAAF). It is a capability similar to NATO AWACS. The RAAF's 'Wedgetail' will be a truly joint capability with integration into the operations of the Navy and Army. Squadron Leader Simon Wildermuth takes us down the path to Initial Operational Capability (IOC).

Finally, the 'Out of the Box' piece invites readers to ponder whether NATO needs a Space policy.

The JAPCC team continues to receive excellent feedback from their easy-to-fill-out survey. Thank you very much for sharing your thoughts and ideas, and please continue to make your voice heard. The survey takes less than 5 minutes and may be found at:

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



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

All comments should be sent to: articles@japcc.de

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

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The Spanish Air Force

Challenges and Chances

An Interview with General José Jiménez Ruiz,
Chief of Staff, Spanish Air Force

Taking into account the 2011 JAPCC Conference theme 'Air Power: A Joint Appraisal', what are your thoughts regarding the Joint nature of Air Power? In your opinion is Air Power employment well understood beyond the Spanish Air Force?

The strategic dimension of Air and Space (A&S) has driven a proliferation of systems operated by other services (Government Organisations (GOs) and Non-Government Organisations (NGOs)) and opened a debate on the Joint nature of A&S Power, while the same discussion doesn't exist within the ground and maritime environments.

There is no doubt the employment of air assets by all forms of military forces has allowed a better understanding of the qualities, capabilities and limitations regarding A&S Power. However, the debate is frequently affected by a certain degree of bias deriving from rigid operational concepts specific to the Services. For instance, the perception on the way you can use an armed aircraft differs markedly from one Service to another and the differences increase further when the counterparts do not belong to the military forces.

For this reason we advocate that, from a truly comprehensive approach (which is more than just Joint), and building on existing specific doctrine, Air Forces should lead all that happens from and toward the air. It is our core competence, the arena where we can



demonstrate our mastery, where we have the authority to establish the policy and guidance to use the proliferating and critical air assets. We favour doctrinal convergence, led by more than a century of knowledge and experience, to provide a seamless and efficient use of the Air and Space.

Considering shrinking defence budgets and the unpredictable and evolving security environment we have to face in the 21st Century, what are the core A&S Power mission areas in which you desire to focus available investments?

There is an open debate on the classical dilemma of being prepared for 'the war' or for 'a war'. We have always been committed to being ready to employ the entire spectrum of A&S Power at our disposal. Our expeditionary operations in Afghanistan are focused on airlift, MEDEVAC and Deployable Air Activation Module (DAAM) capabilities, including the management of Herat Forward Support Base (FSB). We are also supporting our units in the field with some Tactical Air Control Parties (TACPs). If we only focus on that scenario it is easy to conclude the acquisition of A400M is the highest priority, perhaps resulting in collateral damage to the Eurofighter programme through a reduction in capabilities.

But, to open the mind and eyes of those blinded by the 'a war' approach, the crisis in Libya shows us it is still necessary to have the capability to work in the traditional way of Air Power: to first dominate the air to exert the required influence over the surface. In this scenario, there is no doubt that cutting-edge fighters and robust command and control platforms are required, aligning perfectly with our Eurofighter programme.

Along with airlift and combat air, the third prong of my desired core capabilities is ISTAR. The traditional requirement to gather intelligence data is increased in the non-traditional scenarios where we are involved nowadays. In order to provide commanders with the necessary situational awareness, and being congruent with the idea of leading everything related to the employment of air assets, we have programmes to extend the life of P-3s and to acquire an UAS (Unmanned Aircraft System).

The Spanish Air Force (SAF) inventory and existing capabilities appear well balanced; however, one notices that the SAF has not fielded any UAS system (apart from mini-UAS). What are the reasons behind this decision? Are there plans for incorporating UAS capabilities in the future?





The Spanish CN-235 Maritime Patrol Aircraft (VIGMA version) is an AT platform modified for a specialised mission role.

The development and use of unmanned aircraft systems is without a doubt the next great step forward in the evolution of Spanish military aviation. Analysis of modern operations has shown the value of UAS leading to their proliferation year upon year.

As a matter of fact, our Air Force is interested in increasing its ISTAR capabilities with a strategic-operational Medium Altitude Long Endurance (MALE) UAS, setting its expectations in the long term with the development of the Advanced UAV (A-UAV) programme. However, the A-UAV has a long way to go, so the Spanish Air Force considers it essential to have a short-term interim solution of a MALE UAV type.

Due to the worldwide economic crisis after 2008, and, more precisely, Spanish budgetary policy, the Air Force budget has been reduced, which confirms a downward trend, meaning we have had to postpone our plans to procure the UAS interim solution.

However, we are moving forward. Spain is taking the first steps in allowing the flight of these systems in our air space through the creation of 'ad hoc' segregated areas for training and test flights. Furthermore, the SAF will be standing up a UAS Training Centre in Spain, located in Salamanca, where specialised courses will be taught to Ministry of Defence personnel in order to gain and validate military licenses.

In addition, we are considering the development of a new system, the Future Combat Air System (FCAS). This system could represent a combination of manned and unmanned combat aircraft, all operating in an

NEC (Network Enabled Capability) environment, with robust communications and solid air command and control systems.

Would you give your personal assessment on how the two major programs are developing, specifically the Eurofighter and the A-400M? Have you considered the F-35 JSF as a future option to replace the aging EF-18 fleet?

After passing the 100,000 flying hour mark some months ago and with six countries using it, I think the Eurofighter programme has reached its maturity phase. In our case, the system reached Initial Operational Capability (IOC) three years ago in its primary Air-to-Air role and placed on Quick Reaction Alert (QRA). The next milestone in the programme is to station the aircraft at a second main operating base (MOB), plans of which are on course. We expect to field the multirole capability very soon. Overall I would assess the progress of the programme as satisfactory.

Regarding the A400M, once the contract has been signed and the programme is guaranteed, we are developing plans to manage the fleet of 27 aircraft from two different bases. We have high expectations for this programme, with the first delivery scheduled in 2016, and last, in 2022.

Would the F-35 be an option to replace the EF-18 fleet? Why not? But who pays the bill? As I previously said we are working on the staff requirements for the FCAS, which is intended as the Hornet's replacement. We are working to have a precise idea of what

is possible and what is needed to meet our requirements. The development of the Eurofighter's multi-role capability are still under the 'work in progress' label, the possibility to employ a mixture of fighters and Unmanned Combat Air Vehicles (UCAVs) is open and the awesome capabilities of F-35 are welcomed. Nevertheless, we must keep our feet on the ground and look at the budgetary constraints and the economic reality. In the present scenario, we should keep all doors open and wait for the right moment, when technical solutions are mature, economic restrictions relaxed and a robust concept of employment developed. In order to make the choice, all these conditions are expected to occur long after my tenure as Chief of Staff.

During your command, in order to cope with future challenges for A&S Power, what have been your main concerns regarding the education and training of the personnel under your leadership?

Regarding the education processes, let me indicate that academic cycle 2010–11 has been the first one where the new entrance process for the Spanish Armed Forces Officers Academies has been applied. This new education system is born with the premise of total integration with the Spanish University and the Bologna Process¹. The syllabus will provide students with the required level of competences necessary to gain two titles, one degree in engineering and the other pertaining to military rank, which presents a drastic change in the way we prepare our officers. We have also implemented changes for our NCOs. Starting with the course 2011–12, an entirely new programme will be used to gain a dual title. Both changes required a lot of effort and investments, both within the military branch, and in the University and Technical School areas. Nevertheless, I am fully convinced that, despite the challenges of introducing these new processes, the result will improve our personnel's formation, which will return advantages to our institution in the long term.

From the point of view of pure aeronautical education my intention has been to keep our traditional system of an elementary (phase 1) and basic (phase 2) education at the Air Force Academy, whilst employing the

final academic course with the specific specialities pertaining to their airframe (fighter, transport or helicopter (phase 3 and 4)). We have started different programmes to replace the aircraft used by the Air Force Academy, and we are part of the Advanced European Jet Pilot Training (AEJPT) initiative for the substitution of our ageing F-5B fleet.

On the topic of training, in close relationship with the economic situation, it has been necessary to reduce aircrew flying hours, but under the notion to maintain the minimum operational security standards and without changing the minimum requirements necessary to gain combat ready qualifications.

Let's come back to NATO. In the operational arena, would you elaborate on the contribution of the Spanish Air Force to NATO, and furthermore, what do you think the Spanish Air Force has gained as a consequence of being a member of NATO?

In my opinion the Spanish Air Force has gained a lot. I could mention tangible aspects such as common doctrine, interoperability, normalisation, guidance in the transformation processes, or the acquisition of capabilities through pooling resources and shared initiatives, for example NATO Airborne Early Warning (NAEW) or Air Command and Control System (ACCS), which would be unaffordable by a single country such as mine. There is one intangible aspect I'd like to note: the change in the mind-set of the Spanish Air Force people, who have passed from a certain self-sufficient and isolated mentality to a multinational, multicultural and multidisciplinary one, clearly enriching the experience for my institution. The Spanish crews have also won the respect and esteem of people from NATO countries, thanks to our professionalism and technical abilities.

On the other hand, NATO has gained a committed partner who shares the values of the Alliance; geographically well positioned to control the western Mediterranean Sea and to interact with North Africa, strengthening the presence of NATO in the Southern region. Although small in size, the Spanish Air Force provides NATO with a well-balanced and highly capable contribution to the overall force. And more

importantly, with people that achieve the highest standards required for being assigned to the different positions of the NATO's permanent structure.

Finally, the move of the Tactical Leadership Program (TLP) from Florennes to Albacete is an excellent example of how both organisations can gain from our mutual cooperation.

Spain is one of the JAPCC Sponsoring Nations. What are you, as Chief of Staff, expecting the JAPCC to provide to the Spanish Air Force?

From a formal point of view, the Spanish presence in the JAPCC is a way to express a determination to maintain our contribution to the transformation process, from a strategic and operational perspective, within NATO. Our level of commitment in the JAPCC allows us to keep abreast of the latest trends and developments on research, concepts, doctrine and procedures related to A&S Power developed specially from a Joint perspective.

On the other hand, it allows us to exercise national and specific influence on the transformation processes related to A&S Power. Likewise, our personnel are gaining valuable experience in these matters, bringing the excellence back to our Air Force in a seamless and beneficial process.

I would also emphasise the mutual benefits obtained through the on-going existing support and cooperation between the Spanish Armed Forces and the JAPCC. Examples include the JAPCC's Conference, where the Spanish Air Force has contributed and will

continue to play a major role; and the Kindelan Chair², where the JAPCC has had proactive participation. Going even further, into the Joint arena, the JAPCC is working closely with the Counter-Improvised Explosive Device (C-IED) Centre of Excellence³ located in Spain. I think this kind of cooperation is important to achieve fruitful results.

We'd like to finish with a more personal question. Could you please express what have been your most satisfactory and also most unpleasant events or situations since you took over the responsibility to lead the Spanish Air Force?

The most displeasing events are those related to the four people lost in two aircraft mishaps. The most satisfactory situation is the professionalism, behaviour and disposition that are always displayed by all of the members of this service, which I consider to be the main value of the Spanish Air Force. Anyway, I am very keen on football and I will never forget the images of the Spanish national football team passing in front of the Air Force HQ with the World Cup in their hands, and the colours of the Spanish flag sprayed by the 'Patrulla Aguila' over Madrid during the event.

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

1. The purpose of the Bologna Process (or Bologna Accords) is the creation of the European Higher Education Area by making academic degree standards and quality assurance standards more comparable and compatible throughout Europe.
2. The Kindelan Chair is a forum for the study and debate of military air strategy and doctrine between the Spanish Air Force. Amongst its activities there is an annual international seminar where representatives from allied and friendly air forces meet in Madrid to exchange their points of view on specific air topics.
3. The Counter-Improvised Explosive Device (C-IED) Centre of Excellence mission is to provide subject matter expertise in order to support the Alliance, its Partners, and the International Community in the fight against IED and co-operate to increase security of Allied Nations and troops deployed in theatres of operations, reducing or eliminating the threats from improvised explosive devices used or for use, in particular by terrorists or insurgents. The Centre is placed close to the town of Hoyo de Manzanares, province of Madrid.

Air General José Jiménez Ruiz

joined the Spanish Air Force in 1966 and graduated from the Air Force Academy in 1970. As a transport pilot has logged more than 9,000 flying hours and served as the Commander of the 45th Air Force Group in Torrejón AB. He graduated as a staff officer in 1986 and had several national and international assignments including the Air Force Staff, the Directorate of Defence Policy, the NATO-SACLANT Spanish Military Representation and the Air Force Logistics Support Command. He was promoted to General in 2001 and held senior staff positions in the Joint Staff Headquarters and the Air Force Personnel Command. In 2006 he was appointed Commander in Chief of The Canary Islands Air Force Command prior to taking his current position in 2008 as Chief of Staff of the Spanish Air Force.



Ballistic Missile Defence – What's the Big Deal?

By Wing Commander Anthony Stansby, GBR AF, JAPCC

The NATO summit in Lisbon last November delivered an updated Strategic Concept for the Alliance. From an Air Power perspective, one of the key features of this new concept was the announcement of an intention to: *'develop the capability to defend our populations and territories against ballistic missile attack as a core element of our collective defence'*¹

Over the subsequent months, NATO staffs have spent many hours deliberating how best to incorporate this 'new' mission into existing policy, concepts and doctrine. But is defence against ballistic missiles really such a big deal or are they, as this article will argue, just another target set for our Air Defence (AD) Forces?

However, before we can progress with that core question, we need to be clear exactly what is meant by the various terms that are commonly used in these discussions. Sadly, that is not quite as straightforward as it should be thanks to the use of some rather lax language and inconsistencies between

documentation. By way of example, the Strategic Concept quoted above goes on, in the same paragraph, to state: *'We will actively seek cooperation on missile defence with Russia and other Euro-Atlantic partners.'* The implication is that Ballistic Missile Defence (BMD) and Missile Defence (MD) are synonymous; indeed they have been used interchangeably in various documents and declarations. However, in reality, BMD is a subset of MD as is made clear in AAP-6 which defines a missile as: *'A self-propelled munition whose trajectory or course is controlled while in flight'*² while a ballistic missile is: *'A missile which does not rely upon aerodynamic surfaces to produce lift and consequently follows a ballistic trajectory when thrust is terminated'*³. This distinction is important, not least because defence against cruise missiles (another subset) is already considered by NATO to be part of AD.⁴





While not strictly part of this article, it may also be worth clarifying the term 'Theatre Ballistic Missile Defence', again already part of NATO AD⁵. This relates to the defence of military forces (rather than population or territory) but there is often confusion as to whether the term 'Theatre' refers only to the forces operating beyond NATO territory or whether operations on home soil are also covered. The Active Layered Theatre Ballistic Missile Defence Programme Office is quite clear; their remit is the defence of military forces wherever they are operating⁶. These are not mere semantics, and if policy-makers are not clear and consistent, what hope is there that the wider defence community will understand?

So what are the aspects of BMD that, its supporters claim, make it so different? From my experience the following factors are regularly quoted: short timelines for decision-making and action; need for consultation; consequences of engagement; emphasis on Jointness; inclusion of Conventional Counter Force (CCF) as an element of defence; and reliance on Space. This article will look at each of these claims in turn. For ease of scenario painting, I will concentrate primarily on the peacetime environment where BMD will complement Air Policing as a deterrent and show of solidarity. However, I believe that my arguments are equally valid when viewed in a conflict scenario.

Timelines

Nobody will deny that ballistic missiles are quick. Consequently, the time available for a defender to react is limited. The exact time will be somewhat scenario dependent, taking into account such factors as missile speed, range from launch point to target, speed of detection, etc. But the answer is likely to be measured in minutes, and perhaps not many of them. This, say BMD experts, represents a decision-making challenge which is an order of magnitude greater than for traditional AD. But is it really so difficult or so different? Once a potential BM target has been detected, it must be classified and the projected point of impact determined. From that point, there is only one decision to be made – whether to engage or not. Certainly, such a decision must be taken quickly and this will require that Engagement Authority (EA) is delegated to an appropriate level.

For traditional AD, especially Air Policing during peacetime, there may be a series of decisions at different levels of command but these can be equally time constrained. For example, once a new airborne threat has been identified (the equivalent of classification in the BMD field) the decision whether or not to intercept must be made and the need for other supporting assets (such as AAR) must be identified. The whole success or failure of the mission may ride on the timeliness of this process. Once an intercept is achieved, the ultimate decision on engagement may be required. The fact that it will have taken some time for a scenario to build to this point generally allows the EA to be held at higher levels. But this can also add complications as the EA is unlikely to have been monitoring the situation from the start and therefore has less time to build their own situational awareness. In any event, it can take only a moment for an apparently benign airborne target to suddenly demonstrate hostile intent or conduct a hostile act. At that point, the decision to engage may need to be taken in seconds.

Consultation

The physical range of BMs is such that in most scenarios they can be expected to cross several international borders between launch point and impact. Furthermore, engagement opportunities may exist at various points along the flight profile (following the doctrine of layered defence). Consequently, there is potential for countries not directly under attack (or even within the Alliance) to be on the receiving end of debris from a successful engagement. This fact demands that extensive consultation be undertaken at both the political and military levels well ahead of any possible use of BMD. There will assuredly be no time for consultation once a BM is in flight. What are we seeking to achieve from all this consultation? From a military perspective, the aim is to ensure that the Alliance is no more constrained by its boundaries (both internal and with third party states) than is the attacker. Again this is not unique to BMD – there are large parts of NATO where AD aircraft can, even in peacetime, operate across national boundaries without restriction, clearly as a result of prior consultation and agreement. The picture is not perfect, several restrictions remain and the problem is exacerbated in the case of

the terrorist RENEGADE threat. We can only hope that there is a growing realisation that such artificial limitations play into the hands of our foes. Consequently, new rounds of consultation should not be constrained by the BMD agenda but should take a wider perspective and also sweep away some of the constraints that generate inefficiencies for our traditional AD forces.

Consequences of Engagement

Addressing the consequences of an engagement is closely tied to the previous issue; indeed, it is the main driver for consultation. Current technology provides the BM defender with only limited engagement opportunities, not least because of scarce 'shooter' capabilities. Consequently, the ability to choose where debris from a successful engagement will end up is decidedly limited. The same is true in relation to the impact point of defensive munitions which miss their target. As BMs are so regularly associated with Chemical, Biological, Radiological, and Nuclear warheads, the defender must also anticipate the risk of wide area contamination. However, once again I would argue that this is not so different to classical AD. Any target successfully engaged in the air must eventually fall to earth and, while there may be peacetime scenarios when a fighter can pick the moment to engage so as to minimise the impact on those below, having such a luxury is far from guaranteed.

“... there is often confusion as to whether the term ‘Theatre’ refers only to the forces operating beyond NATO territory or whether operations on home soil are also covered.”

In terms of overall consequences, I would also argue that the defender's intelligence picture is unlikely to be dramatically more accurate in relation to BMD than traditional AD; he is unlikely to be any better informed as to the nature of the BM warhead than he is regarding a hostile aircraft's payload. In the latter case, the spread of debris may be more constrained because of the lower speed and altitude (and there is also no risk of creating a cloud of space debris with possible impact on friendly, hostile or neutral satellites) but the



Terminal High Altitude Area Defense (THAAD) flight system operated by U.S. Army soldiers.

fundamental decision remains the same: How can I best reduce the overall effect of the threat with the capabilities at my disposal? With the inevitability of debris and the risk of 'leakers', one area that BMD brings back to prominence is the importance of Passive AD and the need to reinvigorate the links to the civil defence community. This is not a new topic for AD but certainly one that has often received less attention than Active AD with its focus on platform-based capabilities.

Jointness (and Interoperability)

In theory, all AD is Joint. The point is made repeatedly in documents from NATO's Air Defence Committee (ADC) and the Alliance has longstanding Joint Doctrine for Air and Space Operations⁷. It is also abundantly clear that Land, Maritime and Air each fields a wide range of AD capabilities. Such a disparate approach can make life difficult for an aggressor but unless the various contributing systems are truly integrated, any advantage is quickly lost. While NATO makes much of its Integrated Air Defence System (NATINADS), the extent to which all elements have been integrated into a true system of systems architecture has been limited – as often for reasons of inter-

service rivalry as technological constraints. The picture is not all bad but integration and interoperability are constant challenges that often require expensive bespoke interfaces or an enduring manpower commitment to resolve. The latest buzz phrase of 'plug and fight' is currently far from reality. BMD demands a more joined-up approach. The whole sensor to shooter chain is, of necessity, built as a joint endeavour, with initial detection probably coming from space, followed by subsequent tracking shared between sensors operating in all three environments, and engagement (at least in the near term) most probably from a surface unit, be that land or maritime based⁸. Maximising engagement opportunities will require real-time exchange of fire-control quality data, the true test of interoperability. The whole chain will be commanded by the well-established Air C2 structure provided by NATINADS. Perhaps now is the time for membership of the ADC to be reviewed in order that it better reflects the Joint nature of the task and to take a critical look at what classical AD can learn from BMD in terms of true integration.

CCF

Conventional Counter Force (not currently defined in AAP-6) is the term used in BMD to refer to offensive action against an opponent's BM forces on the ground. It is considered a component part of BMD so perhaps here we finally have a clear difference between this and classical AD. The emphasis on CCF is not surprising – BMs make a difficult target in flight and it makes absolute sense to strike before launch if possible. But any sane enemy will also seek to avoid traditional air defences, whether by employing stealth, agility, electronic warfare or other capabilities or technologies available to him. Hence, in order to achieve the required degree of control of the air, air forces have always been required to strike a balance between offensive and defensive strategies. So the difference is more in terminology than in practice. BM *defence* includes an offensive element, while Air Defence sits within a wider counter-air framework which includes Offensive Counter Air (OCA). For me, this is rather muddled thinking, most easily rectified by removal of the term CCF and bringing such missions under the auspices of OCA.

Space

There is no doubt that BMD is heavily reliant on Space – but the same is true for classical AD be it Position, Navigation and Timing services, weather data or Beyond Line Of Sight (BLOS) communications. Where BMD ‘ups the ante’ is in its use of satellites as a source of surveillance data able to provide the ultimate in persistence and global coverage. The question for traditional air defenders is whether some of the information gleaned by these systems could also be of use to them or whether satellite surveillance systems could replace traditional terrestrial capabilities. It should go without saying that, while NATO continues to lack a policy to assure access to space capabilities, the retention of terrestrial fallback solutions remains unavoidable.

Conclusion

For me, it is abundantly clear that Ballistic Missile Defence is simply part of Air Defence and should not be considered as a separate mission. In the short term it may be necessary to speak about ‘Integrated Air and Ballistic Missile Defence’ (IABMD) simply to raise the profile of BMD and the need to bring it within the AD umbrella. However, it is all too easy for such titles to become ingrained and to constrain our thinking. The sooner we revert to a broader view of AD (which includes BMD) the better.

Aside from its additional defensive capabilities, what BMD really offers is a timely opportunity for NATO to address some of the weaknesses within its existing AD system. Most urgently, we must ensure that consultation on AD is not limited to the BMD agenda. If

nations can agree to the principle of BMD interceptors operating across national boundaries, then it makes no sense for AD aircraft to be constrained in their operations across the Alliance. This offers the potential for significant efficiency improvements. The next logical step is to expand this mind-set to the RENEGADE threat. BMD does not differentiate between missiles launched by states or non-state actors, so it is high time to ask why nations cannot take the same approach with the manned aircraft threat.

Integrating BMD into existing AD policy, concepts and doctrine also offers the opportunity to review the balance between the Active and Passive aspects of AD and to reinvigorate the link to civil defence. It should also refocus minds on the need for disparate capabilities to be truly integrated and interoperable. Perhaps the first interoperability test for IABMD is to ensure commonality of terminology; I would propose doing away with the notion of CCF and bringing such missions under the existing banner of OCA. We must also ensure that BMD capabilities, from surveillance to engagement, are able to contribute to the wider AD battle to the maximum extent possible. Finally, it may be time for NATO’s ADC to welcome a wider membership, particularly from the Land Component, to ensure that Joint Air Defence is debated in a truly Joint environment. ●

1. PQ(2010)0169 – The Alliance’s Strategic Concept – dated 19 November 2010, paragraph 19.
2. AAP-6(2010) – NATO Glossary of Terms and Definitions – Page 2-M-8.
3. AAP-6(2010) – NATO Glossary of Terms and Definitions – Page 2-B-1.
4. C-M(2009)0111 – NATO Air Defence Policy, Annex 1, Appendix 3.
5. C-M(2009)0111 – NATO Air Defence Policy, Annex 1, Appendix 2.
6. ALTBMD Programme Office presentation to Extended Air and Missile Defence Conference Hamburg 6 – 9 Jun 11.
7. AJP-3.3(A) – Allied Joint Doctrine for Air and Space operations – dated 5 November 2009.
8. See for example: http://www.spacewar.com/reports/STSS_Demonstration_Satellites_Demo_New_Remote_Cueing_Capabilities_During_Aegis_Test_999.html accessed 25 Jul 11.



Wing Commander Anthony Stansby

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



Australia's Wedgetail

Linking the Joint Battlespace

By Squadron Leader Simon 'Beast' Wildermuth, AUS AF, 2 Squadron

"There is nothing which persevering effort and unceasing and diligent care cannot accomplish."
Seneca

Introduction

The introduction of an Airborne Early Warning and Control (AEW&C) capability into the Royal Australian Air Force's (RAAF) order of battle will be a major milestone in the transition of the Australian Defence Force (ADF) into a network-enabled force. The capability, named 'Wedgetail', is built on a Boeing 737NG airframe, with a Northrop Grumman Multi-Role Electronically Scanned Array and a BAE Systems Electronic Support Measures suite derived from the AN/ALR-2001. Its RAAF crew is augmented by Royal Australian Navy (RAN) controllers and other specialists as required to conduct specific missions.

The AEW&C capability is not a new concept; airborne control platforms have been operated by US, UK and NATO forces for many years. However, it does represent a new step for Australia and provides a much-needed central node in the emerging networked force. Capable of data exchange via voice, and tactical digital information Link-11 and Link-16, Wedgetail also enhances the ADF's ability to provide data exchange connectivity for single service, joint, and coalition forces within the battlespace.

This article describes the steps the RAAF has taken to progress this new capability towards operations in the complex and multi-faceted battlespace of the future.

Framework

The Wedgetail was acquired by the RAAF as a Foreign Military Sale through Boeing Defence Systems in the US.



From the beginning, the RAAF embedded operators within both the resident project team and the contractor's organisation in Seattle, US, to help ensure the capability would meet Australia's requirements. These positions were instrumental in building a deeper-level of comprehension of the design of one of the most complex defence programs undertaken by Australia.

To reduce delays and permit the commencement of training, Australia agreed to an incremental delivery strategy that saw the first four aircraft transferred to the Australian State Register, albeit in an initial configuration. This delivery strategy drives an incremental acceptance approach whereby elements of capability are delivered gradually in the lead up to an Initial Operating Capability (IOC) for the RAAF. Once all capability elements are delivered, and successful operational testing is complete, Final Operating Capability (FOC) will be declared and the capability available for its full range of operations.

Initial acceptance allowed the RAAF the opportunity to commence aircrew and maintenance training whilst system development continues. This training has facilitated Australia in developing initial tactics, techniques and procedures (TTPs) for sorties based at

the home maintenance base at RAAF Base Williamstown, New South Wales, and from other bases within Australia.

The Path to Initial Operational Capability

"We must also prepare for future wars – and these wars will probably be unlike the one in which we are currently engaged. This is why we must continue to acquire new high-end capabilities, train for and practise high-end warfighting techniques and find new ways of doing them better."

Air Marshal G.C. Brown, AM, Chief of Air Force

The ADF desires to be a networked, expeditionary force, combining all aspects of the network and cognitive dimensions of future warfare. To support the development of a network enabled joint force, Wedgetail must lead the way in delivering the AEW&C elements required by the RAAF, as well as integrating the network requirements of the RAN and the Army. Australia's approach seeks to deliver a joint capability from the outset by undertaking integration development with RAN and Army network capabilities in parallel to expansion of the RAAF AEW&C capability.¹ The RAAF drives its progress in accordance with its Future Air and Space Operating Concept (FASOC), the Air Force's developmental imperatives and preferences for the operational and organisational dimensions. The FASOC precepts include a networked, expeditionary force, able to operate seamlessly in a joint environment by bringing the right effects through precise control.²

Wedgetail is a critical element of the future networked force. Over the previous ten years Australia has embedded personnel across the globe to gain experience in airborne command and control operations working with the US Navy, US Air Force and US Marine Corps, and the Royal Air Force; flying on E-2C Hawkeye, and E-3B, E-3C and E-3D AWACS aircraft. These personnel have returned to the RAAF to help guide the development of an organic AEW&C capability. However, simply operating the platform based on the experience drawn from overseas forces is not enough to support the unique operational environment that Australia faces. The introduction of Wedgetail provides

the opportunity to take the best from overseas and integrate overseas practices with the requirements of the Australian operational context.

For Wedgetail to become a truly joint capability, it requires more than just functionality within the air domain. It must be integrated into the operations of the Army and Navy.

Army Integration

“True GBAMD and CRAM capabilities must consist of a layered system of response capabilities interconnected through the provision of Airspace Battle Management and Situational Awareness.”
– Adaptive Campaigning – Future Land Operating Concept (AC-FLOC)³

Wedgetail operations with the Australian Army have been limited to date as they begin to implement changes within their own fighting force as part of the move towards the Future Land Operating Concept, an approach that will significantly enhance the future capabilities of the Australian Army. Part of this significant change stems from the goal of producing a cogent, effective and sustainable Air-Surface Integration capability able to support the full spectrum of operations in the Australian strategic environment. This will require the optimisation of the land force for joint operations and a subsequent reliance on joint enabling capabilities for required effects. At the core of Army's response to this directive is the amalgamation of the Army's Air Defence Regiment and their Ground Liaison Group into a unified Air Land Regiment with a Link-16 capability under the auspices of the 6th Brigade. This change sets up joint Air Land Integration as a core Army function by synchronising and integrating key air-land functions into a joint construct.⁴

Wedgetail, in addition to other Air Force capability initiatives, will assist the Army in realising its future intent. Since initial acceptance of the Wedgetail platform, the Air Force has operated with Army Ground-Based Air Defence forces to exercise early-warning/cueing scenarios against an air threat using voice-tell procedures. This has been followed up by Link-16 data exchange with a dedicated Air-Land Integration Cell (combining

elements of the Air Liaison Element, Joint Terminal Attack Controllers and the Tactical Air Control Party) in the lead up to the amphibious phase of Exercise TALISMAN SABRE 2011 – the premier high-end war fighting biennial exercise with the US. As the Army expands its Air-Land Integration function, the Air Force will similarly increase Wedgetail integration with ground forces to maximise interoperability. Of note, these operations will not be restricted to working solely with Australian land forces. The intent is to expand the RAAF's AEW&C interaction with other allied combat control and Forward Air Control forces to continue to build skills in provision of support to ground forces.

Navy Integration

“Integration of the three Services in a joint operating environment is vital to mission success and the seamless force.”
– Future Maritime Operating Concept 2025⁵

The RAN has been operating Link-11 data exchange for decades and has well-developed procedures for tactical datalink operations within the Fleet. However, the RAN is undertaking significant changes to their fleet capabilities to support Australia's future security environment. The upgrading of the ANZAC Class FFH warships, the introduction of SM-2 along with the acquisition of the three HOBART Class Air Warfare Destroyers – equipped with SM-6 – has reinvigorated a focus on air warfare and increased the area of influence around Australia's surface ships. The RAN has introduced a Link-16 capability that will enable greater data exchange capacity within the maritime domain, while creating improved interoperability with Australian and Allied Air and Land forces; these improvements in interoperability will provide a framework for the future introduction of Cooperative Engagement Capability (CEC) on the Air Warfare Destroyers and possibly Wedgetail⁶.

Historically, the greatest integration of RAAF capabilities and RAN forces has been in the detection and prosecution of surface and sub-surface targets by the RAAF's AP-3C maritime patrol and ISR capability. Fighter coverage within the Australian Air Defence Ground Environment is limited by the unrefueled duration of the aircraft, however, the acquisition of the Airbus



A RAAF Air Combat Officer investigates a track of interest on-board Wedgetail.

A330-derived KC-30A aerial refueller will significantly extend the defensive air umbrella. Wedgetail will further enhance the air defence capability through increased low-level and over-the-horizon detection ranges, radio relay, Link-11 to Link-16 data forwarding, cueing to surface contacts, and, in the future, cooperative engagement. This will enhance the RAAF's support for the RAN's organic air defence systems.

Another significant Wedgetail capability is the management of the air domain within the maritime battlespace. Recent experience at Exercise RIMPAC and various Australian Naval exercises has provided an opportunity to introduce Wedgetail capabilities to the maritime community and refine elements of tactical doctrine for operations with surface forces. This has included direct interaction with the Air and Surface Warfare Commanders regarding allocation of targeting, employment of Combat Air Patrol, early-warning of incoming strikes, and integration of identification and classification.

Plans for the remainder of 2011 and 2012 include increased sortie rates in support of fleet training, ship work-up exercises, and trainee warfare officer at-sea consolidation. Wedgetail's participation in these activities reaps two benefits: exposure of aircrew to the conduct of operations in the maritime battlespace, and surface warfare commanders familiarisation with AEW&C capabilities. This training will be followed by

further war-gaming and joint TTP development, including exploration of Wedgetail's support to the surface fleet within the maritime battlespace.

The RAAF

The introduction of the Wedgetail capability in the RAAF is a critical first step towards a seamless joint-capability. As the RAAF increases its networked forces, including F/A-18F Super Hornet, F-35 Joint Strike Fighter, KC-30A aerial refueller, Jindalee Over-The-Horizon-Radar, and Vigilare (the newly delivered command and control operating system for the Air Defence Ground Environment), Wedgetail will be capable of linking remote combat elements from long ranges, providing additional radar coverage; managing the increasingly complex datalink network; and distributing the recognised picture – all essential to efficient and effective management of the battlespace. Already, the operation of datalink between air and ground elements is a routine activity, with Wedgetail a contributor to the Recognised Air and Common Operating Pictures. As Wedgetail integrates with more link-capable forces, the RAAF's network modus operandi will evolve to where a networked force is considered the standard rather than an enhancement. Large steps towards this integration were achieved during Exercise ACES NORTH 2011 where Vigilare, Wedgetail and fighter aircraft were linked together in the execution of complex, large force missions.

Large Exercises

Wedgetail is capable of managing the operations of all aircraft within its surveillance volume, including aircraft of all roles, ranging from Joint Personnel Recovery, to strike and counterair, ISR, and air mobility. However, a regular concentration of dissimilar capabilities is required to fully train to this level of performance, an opportunity that only occurs during the conduct of large-scale exercises. In the short time since initial acceptance, Wedgetail has participated in large-force joint and combined exercises of varying sizes and composition and will continue to do so, as the RAAF works towards FOC. These large-scale exercises have exposed initial TTPs to levels of friction and constraints that are not encountered in the local environment, resulting in more robust outcomes, and a program that is a more realistic representation of the warfighting battlespace.

Flying is not the only component of the RAAF's AEW&C development to date. The path to IOC requires more testing to amend and verify the ability to conduct operations away from the main operating base with, and without, external support. To achieve the required standards, the Air Force has exercised the ability to deploy without external support to many airbases in Australia and tested the ability to move a larger size force for longer durations to remote Australian bases, such as RAAF Base Tindal in the far north and RAAF Base Pearce in the far west. The next step is to increase the distance and complexity of deployments to overseas locations, testing the effectiveness and integration of operational, administrative, logistical and maintenance elements.

Conclusion

The RAAF has a busy schedule in 2011 and 2012 for its emerging AEW&C capability, including increasing integration test and evaluation with the RAN and the Australian Army, and exercise participation with forces from Malaysia, Singapore, the UK and the US. Air refuelling, surveillance, and battlespace management are all on the agenda, as well as continuing exposure to networked operations and refinement of TTPs.

The addition of Wedgetail to the ADF's order of battle represents a significant step along the path to a networked, expeditionary force. Having airborne surveillance and battlespace management, connected through Link-11 and Link-16, and operating in support of joint, combined and allied air, ground and surface forces, provides Australia with a critical warfighting element for the future force. Challenges remain prior to final operational acceptance, but the progress to date has enabled considerable headway in integrating Wedgetail surveillance, networking and control capabilities into the ADF's war-fighting mind-set. ●

1. Department of Defence. *NCW Roadmap 2009*. Canberra: Commonwealth of Australia, 2009.
2. Air Power Development Centre. *The Future Air and Space Operating Concept*. Canberra: Commonwealth of Australia, 2007.
3. Australian Army. *Adaptive Campaigning – Army's Future Land Operating Concept*. Canberra: Commonwealth of Australia, 2009.
4. Ibid.
5. Sea Power Centre – Australia. *Future Maritime Operating Concept 2025*. Canberra: Commonwealth of Australia, 2010.
6. Department of Defence. *2009 Defence White Paper, Defending Australia in the Asia Pacific Century: Force 2030*. Canberra: Commonwealth of Australia, 2009.



Squadron Leader Simon 'Beast' Wildermuth

commissioned through the Australian Defence Force Academy as an Air Defence Officer in 1995. Following operational and instructional postings in the Air Defence Ground Environment, he was posted on loan to the USAF's 963d Airborne Air Control Squadron serving as an Air Warfare Officer and Senior Director on the E-3B/C Sentry AWACS. During this tour he became the first RAAF Officer to graduate from the US Marine Corps Weapons & Tactics Instructor course. He was posted to the Australian AEW&C Resident Project Team in Seattle during ground and flight Design and Type Acceptance Test and Evaluation. He returned to Australia in 2010 and is currently the Executive Officer of No 2 Squadron which operates the Wedgetail.



Polish Air Force Su-22 takes off on a training mission.

The Threat Still Exists – Suppression of Enemy Air Defences

By Major Sebastian Maślanka, POL AF

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Introduction

The importance of gaining and maintaining air control of the air is clearly expressed in Allied Doctrine. Freedom of action for all friendly forces and their minimised vulnerability to detection and attack are the most significant outcomes of Offensive and Defensive Counter Air operations. While surface attack, air-to-air missions, and Suppression of Enemy Air Defences (SEAD) collectively comprise the offensive side of the Counter Air campaign, in recent decades it has been Ground-Based Air Defences (GBAD) which have proved to be the greatest threat to friendly Air Power. While the popular perception of

SEAD effectiveness is tied to “not losing a single aircraft”, there are other operational aspects that must not be overlooked. Since effective SEAD creates favourable conditions for the conduct of all offensive air operations and reduces risk of attrition to friendly air assets, it typically is of prime influence to the achievement of the Air Component Commander’s objectives. The proliferation of advanced Surface to Air Missile (SAM) systems and modern GBAD around the world has made it almost a certainty that NATO Air Power will be required to operate in a high threat environment. With this in mind, it is important to discuss in greater detail the operational and technical aspects of future SEAD from an Allied air operations perspective.



SEAD in Allied Doctrine

A brief description of SEAD is included within the Offensive Counter Air section of AJP-3.3(A) Allied Joint Doctrine for Air and Space Operations. A more detailed definition, in AJP-3.3.1 (B) Counter Air, describes SEAD as “that activity which neutralises, temporarily degrades or destroys adversary air defences by destructive and/or disruptive means.”¹ It should be noted that suppression can be accomplished by destructive (lethal, kinetic) means, which focus on the physical destruction of enemy air defences, or disruptive means, which make enemy air defences temporarily ineffective through non-kinetic activity. SEAD operations fall into three categories: Joint Operations Area (JOA) Air Defence System Suppression, Localised Suppression and Opportune Suppression. JOA Air Defence System Suppression is viewed as the most rewarding of the SEAD triumvirate as it targets high payoff assets and inflicts system-wide degradation of the enemy air defence system by disabling its major capabilities or components. Localised Suppression focuses on protecting specific operations and missions, consequently it is limited to geographical areas associated with ground targets and friendly transit routes and focuses on immediate effects. Opportune Suppression complements JOA, and localised activities, and targets GBAD systems that are not identified early enough for pre-planned suppression.

Impact of SEAD

While popular perception ties SEAD to protecting friendly aircraft from being shot down by enemy SAMs and measures its effectiveness by numbers of downed planes, the story is much more elaborate. Using ‘measures of effectiveness’ as proposed by

Christopher Bolkcom from the U.S. Congressional Research Service, one should look, in addition to combat attrition, at the level of effort expended for SEAD relative to total combat sorties and its impact on air operations efficiency.² When aircraft losses are totalled in consecutive operations it becomes clear the SEAD contribution to aircraft survivability is substantial. To assure full freedom of movement for friendly air assets, however, the SEAD effort rises sharply with the overall combat sorties flown. During the Vietnam conflict SEAD sorties constituted only 5% of the overall air effort. In Operations Northern and Southern Watch, suppression missions made up 25% of the total combat sorties. This number increased to 32% during Operation Deliberate Force³. As the safety of friendly air assets and their freedom of movement remain an important feature of Allied air operations, SEAD will most probably constitute a significant portion of air effort into the future. Effective SEAD, or its failure, has a heavy impact on the overall effectiveness of air operations. While enemy air defences remain operational, the ability of friendly air assets to conduct operations will remain limited, with particular effect to aerial reconnaissance and surveillance operations. This, in turn, reduces the ability to strike mobile targets, thus hampering overall joint objectives. Historically, SEAD missions were almost entirely flown in the initial stages of operations. Today, SEAD may be flown throughout the conflict. When the synergy of all the above aspects and their implications are considered, the true importance and value of effective SEAD becomes evident.

NATO Lessons Observed

NATO Air Power gained significant SEAD experience during operations in the Balkans in the 1990s. During Operation ‘Deny Flight’ (between 1993 and 1995) Allied aircraft enforcing the no-fly zone were targeted by Bosnian Serb Air Defence SAMs, however restrictive Rules of Engagement (ROE) aimed primarily at protecting UN troops on the ground precluded efficient SEAD operations. The situation changed during Operation ‘Deliberate Force’ in the summer of 1995, when the offensive use of Air Power was authorised against Bosnian Serb targets. During the two week operation, SEAD assets flew 785 of 3,535 sorties,

providing 115 protective windows for attackers. Suppression missions constituted 22.2% of total sorties and 32.2% of shooter sorties.⁴ Of the 70 Integrated Air Defence System (IADS) targets attacked, 52 were destroyed and 7 suffered moderate to severe damage. The requirement for two-source correlation of hostile intent limited the self-defence abilities of SEAD aircraft; however it proved effective and contributed to the avoidance of collateral damage. As Allied Air Power attacked predominantly fixed targets the effectiveness of SEAD missions was high.

Suppression of Serbian air defences during Operation 'Allied Force' proved to be much more difficult, because as the Serbian IADS elected to act 'non-cooperatively', it was difficult to target, attack and destroy its mobile elements. The topography of Kosovo, adverse weather conditions and the widespread use of deception further made air operations particularly difficult. Consequently, approximately two-thirds of the SA-2 and SA-3 batteries (fixed) were eliminated, but only 3 out of 22 SA-6 (tactical) sites were claimed to have been destroyed. This required a larger than anticipated suppression effort (14,006 sorties against IADS versus 10,808 strikes against other targets)⁵ and force packaging needed to account for the constant threat of enemy SAMs for the duration of the operation. This constraint on the availability of air assets for other strike missions limited the pressure against strategic targets. NATO losses were low for manned assets (only two, to include one F-117) but significantly higher for unmanned platforms operating at lower altitudes. Despite the ultimate success of Operation 'Allied Force', the need for improved SEAD capability was revealed. The deficiencies were addressed in both the Defence Capabilities Initiative and Prague Capabilities Commitment. In the latter document, individual Allies made firm and specific political commitments to improve their SEAD capabilities to enable Allied operations in high threat environments.⁶

Future Threats

After several years of stabilisation operations with no significant interference to allied fixed wing air assets, we must remind ourselves that not only does the threat to Alliance Air Power still exist; it has increased

in sophistication over time. There is a strong probability that future NATO-led operations will encounter more advanced air defences, more skilled and determined operators and a shift in air defence philosophy. The importance placed by NATO on security may encourage potential adversaries to adopt tactics which seek to inflict significant Allied casualties in order to outrage public opinion and weaken support. Attempts to engage military aircraft with Man Portable Air Defence System (MANPADS), Anti-Aircraft Artillery (AAA) and even mobile SAMs anywhere over the JOA may be examples of such tactics. Intentional placing of air defence systems by adversaries in close proximity to civilian population will create uneasy choices for NATO. Limiting SEAD to disruptive means may increase the threat to Allied aircraft but provide greater protection to the civilian population. Adopting a destructive campaign, however, risks unintended collateral damage. The balance is tenuous and if we get it wrong we risk the loss of trust and public support. Availability of specialised SEAD assets will almost certainly become a factor in future operations. For example, when non-combatant evacuation operations are planned in a permissive environment and a ground threat emerges, aircraft self-protection may not be enough. Moreover, multiple simultaneous operations will impact the availability of already limited allied SEAD assets.

State of the art air defence systems are a threat to Air Power in collective defence scenarios, but it is also reasonable to assume that, due to proliferation of double digit SAMs, there is a possibility they will be encountered in a crisis response scenario, as part of a less sophisticated system. Future air defence systems will be built around many interrelated, mutually supporting and inherently redundant elements. The overall system will possess an enhanced passive track, identification and engagement capability.⁷ The engagement segment will include a large number of mobile SAMs together with fighters, AAA and Electronic Attack assets. Future IADS will be less susceptible to SEAD due to extensive and synergistic use of camouflage, concealment and deception. In the future such increasingly lethal IADS may threaten NATO airmen and aircraft, leaving today's SEAD arsenal ineffective.



Election day in Iraq. A TSU member holds a RPG.

Future Responses

There is neither a single 'silver bullet' technology nor a set of perfect tactics which will facilitate the swift defeat of adversaries' air defences in the future. A holistic approach which takes into account both the tactical and operational implications of SEAD operations will be required, employing a combination of skilful tactics, Electronic Warfare, stand-off weapons and employment of Unmanned Aerial Vehicles for reconnaissance and strike missions. The current SEAD inventory in most NATO nations' arsenals may remain effective for a few years to come, but it may very well force an increase in SEAD efforts at the expense of other priority missions. At the time of sharp declines in defence spending it is unrealistic to expect more money to be spent on new generations of costly, specialised manned SEAD platforms and systems. Future SEAD capabilities will most likely utilise innovative and more cost-effective technologies such as mini and micro Unmanned Combat Aerial Vehicles, as well as, hypersonic, high power microwave and directed energy weapons. SEAD operations against state of the art air defences are often envisioned as a coordinated series of multi-tactic, multi-platform attacks against as many IADS nodes as possible. To execute these attacks, a sufficient number of networked destructive and disruptive effects are needed, which may prove too costly.

Technical aspects aside, the response to enemy air defences must be as clean and surgical as possible to avoid or at least minimise civilian casualties. This will demand meticulous planning and execution of both destructive and disruptive elements of SEAD. Consensus on ROEs to allow efficient suppression will also be required to avoid falling prey to 'virtual attrition' devised by skilful adversaries.

Conclusions

The ability of Allied air assets to operate with relative freedom and safety in enemy airspace will determine not only the success of air operations, but will influence the outcome of future NATO operations. As surface-to-air threats are likely to remain one of the more serious challenges to Allied Air Power, they require sufficient attention and understanding. The future of NATO SEAD will demand a holistic approach transcending a purely technological focus. Understanding both the tactical and operational implications, flowing from the success or failure of SEAD, should be imprinted not only in the minds of airmen, but on all decision makers within the chain of command. ●

1. AJP-3.3.1 Allied Doctrine for Counter-Air, July 2010.
2. Ch. Bolkcom, Military Suppression of Enemy Air Defenses (SEAD): Assessing Future Needs, CRS, Washington D.C. Updated January 24, 2005.
3. Ibid, CRS-5.
4. R. Owen, Deliberate Force. A Case Study in Effective Air Campaigning, AU Press, Maxwell AFB June 2000.
5. A. H. Cordesman, The lessons and non-lessons of the Air and Missile Campaign in Kosovo, CSIS, Washington D.C. 2000.
6. Prague Summit Declaration issued by the Heads of State and Government participating in the meeting of the North Atlantic Council in Prague, Czech Republic, 21 November 2002 available from: www.nato.int/cps/en/natolive/official_texts_19552.htm?selectedLocale=en
7. More detailed discussion on that issue in: J. W. Wamhoff, Jr, Storming Camicus: Rolling Back the IADS in 2030, ACSC, AU, Maxwell AFB 2008.

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is the assistant lecturer at the Air Force and Air Defence Institute, National Defence University (NDU) in Warsaw, Poland. He is a graduate electrical engineer of the Military Academy of Technology in Warsaw with specialisation in SA-3 and SA-6 missiles. Upon graduation in 1999 he served as the MANPADS platoon commander in the 25th Air Cavalry Brigade. He then went on to be the SA-3 battery commander in the 3rd Air Defence Brigade. In 2006, after graduating from the air command and staff studies at the National Defence University, he was assigned to the Air Operations Centre in Warsaw as a specialist in the EW/SEAD cell. He teaches ground based air defence operations and airspace control.



Indirect Fire – Understanding the Threat

By Wing Commander Jez Parkinson, GBR AF, JAPCC

Introduction

The original intention of this two-part article was to discuss the capabilities required in a NATO Counter-Rocket, Artillery and Mortar (C-RAM) system, attempt to capture the key elements of such a system, and explain them in broad terms in a single document. This was prompted by the fact that it has become apparent over a protracted period that issues exist over the provision of C-RAM capability, most of which arise because of a lack of understanding of the subject itself. Having started to explore C-RAM it quickly became clear that C-RAM could not be discussed in isolation, and what is actually required is a review of Counter-Indirect Fire (C-IDF), a far wider subject area of which C-RAM is just one element. The first part of the article considers the importance of understanding the threat posed by IDF, together with factors and measures to mitigate that threat. In Part Two we will address C-RAM and its role in countering the IDF threat.


The Dilemma

Conflict in Iraq and Afghanistan has shown that an enemy with access to relatively simple IDF weapon systems can have a disproportionately adverse impact

on the ability of modern armed forces to conduct operations. While the number of casualties inflicted by IDF may be comparatively small, the psychological impact on forces who cannot effectively counter such a threat should not be underestimated, particularly if the frequency of attacks is high. Furthermore, and perhaps more significantly for NATO, the inability of any military force to protect its personnel from a threat is likely to attract media attention, with potentially strategic impact.

The Threat

Indirect fire can theoretically come from virtually any weapon system. Celebratory fire from AK47 and similar infantry weapons has caused a number of casualties during recent operations. However, the primary threat is from rockets, artillery shells and mortar rounds, all of which come in a huge variety of calibres, ranges, and payload, and with varying degrees of accuracy.



The Counter-Rocket, Artillery (C-RAM) Missile gun fires during a test in Iraq.

The common factor is the manner in which the weapon is used to engage a target and as the phrase 'indirect fire' would suggest, the round or projectile does not travel directly along the line of sight to the target, but follows a parabolic trajectory; as such, it can be fired over terrain features and buildings which in turn can be used to provide cover for the firer.¹ In determining the nature of an IDF threat, knowledge of the weapon systems available to an adversary is a key factor. Having identified likely weapon systems, the next step is to seek to understand an adversary's 'appetite for risk'. If an adversary possesses only a small number of a particular system and an equally limited number of personnel skilled in its operation, he is less likely to risk its use against other than high-value targets with a reasonable chance of a success, or in situations where it is likely to be lost and the firer killed or captured. Conversely, if a weapon system is readily available and sustainable, is easy to use and can be fired with limited exposure of the firer, that system may become the weapon of choice.

Artillery pieces and mortars require time to bring into action, even for well-trained crews, and have to be taken out of action and redeployed after firing. During this activity both the weapon system and its crew are vulnerable to observation and subsequent engagement or capture. On the other hand rockets, although often designed to be fired from launchers, can nevertheless be fired without a launcher by exploiting terrain features, walls or from simple, improvised launchers. For example, Chinese/Russian/Iranian-made 107 mm rockets can readily be replenished from other sources, can be concealed and moved across difficult terrain and are extremely simple to fire with no extra launch equipment needed other than something to place the rocket on in order to elevate it to a firing angle while aiming it in the direction of the intended target.

Basing Considerations

This Journal has previously considered airfield basing considerations,² concluding that while such issues as selection of location, development planning from occupation to handover, and understanding the threat environment are vital, they all too often do not form

part of the basing decision process. In IDF terms, there are situations where with current technology it will be extremely difficult to establish an effective C-IDF capability. Such situations may include the location of a base within or close to a centre of population, where detecting a launch in sufficient time to sound a warning, intercept an incoming round or engage the Point of Origin will not be possible or desirable. In a location of this kind, the hardening of all accommodation would be desirable, but even this expense would not protect personnel working outside.

A further consideration for air basing is the orientation of the base in relation to the likely direction of origin of the IDF threat. If incoming rounds would have to be intercepted over aircraft operating surfaces, these surfaces would have to be cleared of debris before air operations could recommence; where the number of aircraft movements precludes this, the creation of a C-IDF system with an 'intercept' element may not be an option. Finally, it should be remembered that if, for whatever reason, the number of base locations in any area where an IDF threat exists is reduced, the threat will be concentrated on the remaining locations and the number of IDF events may increase at those locations.

Cultural Factors

Understanding how an adversary thinks and what motivates him – in other words his 'culture' – is a further element in countering any IDF threat, particularly in the context of a Counter Insurgency campaign. Where a 'warrior culture' exists, for example, the act of mounting an attack is as important as its effectiveness, and seeking to eliminate an IDF threat may simply result in an adversary adopting another method of attack that could ultimately be both more difficult to counter and more effective. Accordingly, in countering the IDF threat a balance between 'active' and 'passive' measures should be considered. Similar cultural considerations may also apply to an adversary endeavouring to understand Alliance culture. For example, the need to minimise the risk of collateral damage can be exploited by his use of highly populated areas, where both cover from observation is better and the chance of being engaged is greatly reduced.



To cite a real-world example of the effect of culture, in Afghanistan the Coalition's ability to both detect and engage those involved in mounting IDF attacks has led the Insurgency to pay or coerce the local population into conducting attacks. Targeting such individuals does nothing to help win the 'hearts and minds' of the population and may in fact have the effect of creating more recruits for the Insurgency. Again, a combination of 'active' measures designed to capture and avoid engagement whenever possible, and passive measures designed to defeat an IDF attack or to mitigate its effect, stand to be most effective.

Understanding Tactics

Any discussion on tactics will undoubtedly generate a diversity of views, but in C-IDF two relatively simple questions can be asked, which if correctly answered, should lead to the development of a successful C-IDF strategy:

*What does the enemy want to achieve and why?
What must we achieve and why?*

In order to answer both questions, each must be considered at the strategic, operational and tactical levels. Clearly, answers will vary according to the location and threat scenario, but with a considerable range of capabilities that can be deployed against an IDF threat, understanding the context of the threat will better allow the planner to create the optimum mix of C-IDF capability that will minimise the threat in an effective, resource-efficient way. This will also avoid driving the enemy to abandon a tactic that may not be particularly effective and has numerous counters and, in so doing, drive him to adopt a tactic which is far more deadly and less easy to counter.

Active Measures

There will be those that will have read the 'Basing Considerations' paragraphs and disagreed that in the scenario presented, hardening would be the only option, arguing instead – or as well as – for the domination of those areas outside the base identified as locations from which IDF attacks could be mounted. Although this is a sound argument, a multitude of other factors

will need to be considered before deploying this option. If a range of external threats are arrayed against a base (for example a Surface to Air Fire threat against aircraft) then a Force Element (FE) operating outside the wire would be an effective counter. However, if the only threat is IDF and considering the 'cultural' issues discussed above, placing an FE outside the wire to try to curtail IDF activity may lead to a change in enemy tactics which subsequently leads to an increased number of casualties and the emergence of a threat that is more difficult to defeat.

Passive Measures

Any active system deployed to detect, track and engage an incoming projectile whilst also warning personnel within the predicted impact area is inherently complex and is highly likely to be required to function continuously. It is a simple fact that there will be occasions when the system will fail due to a technical fault or, for reasons that will require subsequent investigation, fail to engage and/or destroy incoming rounds. For this reason, should the threat necessitate it (in term of the number of rounds fired at any location) passive protection measures will also be required as part of an overall C-IDF strategy.

While it is not intended in this article to detail all possible measures, the hardening or improvised protection of buildings where people work or sleep should be considered. Places of 'mass gathering', such as dining facilities and gymnasiums, should be compartmentalised in order to minimise IDF casualties. Clearly an important part of protecting personnel from an

IDF threat lies in training them on how to respond to an IDF alarm or incoming rounds.

It would be impossible to cover all potential IDF scenarios here, but it is likely in all scenarios that warning time, if it occurs at all, will be extremely short. Personnel must therefore know exactly how to react and do so immediately. There will need to be an understanding amongst all personnel that in some circumstances IDF casualties will be unavoidable, for example a round impacting without warning on a soft-skinned vehicle with several occupants, so drills needed to be focused on taking simple action quickly. On hearing the IDF alarm or an unexplained explosion, the action most likely to save life and reduce injury is to drop to the ground and lie as flat as possible to minimise the chance of injury from being blown over, hit by fragmentation or other flying debris.³ Experience has shown that personnel who have had a round impact very close to them but have been in the prone position have avoided serious injury, while those much further away but running for cover have been severely injured by blast or fragmentation.

In Part Two of this article, due for publication in JAPCC Journal 15, we will look in more detail at the various means of countering the IDF threat and, in particular, the role played by C-RAM and the factors and considerations associated with its employment. ●

1. It should be noted that in the case of rockets, the firer does not have to be present at the launch site at the time of firing, with radio control, command wire and timers all being possible launch mechanisms.

2. From Airfield to Airport: Airbase Laydown – JAPCC Journal Edition 10.

3. In a theatre where a chemical or biological threat is present and if the Chemical Safety Rule is in place, the donning of respirators may also be part of the required IDF drill.

Wing Commander Jeremy Parkinson

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A German soldier securing an external load to a CH-53 helicopter.

Integrating Joint Capabilities Beyond Ground Support

Air Surface Integration

By Lieutenant Colonel Thomas Früh, DEU AF, MoD Bonn

Cooperation between the Army, Navy and Air Force is nothing new. Contemporary operations show that joint capabilities are required to achieve mission objectives. In particular, the Air Force's assets have the flexibility to support ground forces which are often operating in a dispersed fashion, far away from their main operating bases and with little or no organic fire support or reconnaissance assets. To achieve an extensive integration of joint capabilities at all levels of command, NATO members and other nations are developing different, but often overlapping, conceptual approaches. These are known variously as 'Joint Enabling', 'Joint Fire Support', 'Air-Land Integration' or 'Air Surface Integration', a range of terminology which does nothing to aid understanding.

Integrating Joint Capabilities

Picking-up the lessons-identified from contemporary operations the German armed forces identified the need to improve mutual support at the tactical level. The German Army initiated a conceptual approach called 'Streitkräftegemeinsame Taktische Feuerunterstützung' (STF) (literally: 'Joint Tactical Fire Support') as a subset of 'Joint Fires'. It primarily copes with unidentified targets or targets evolving during a change in the ground situation.

The German Luftwaffe was asked to contribute to STF mainly by providing Close Air Support. But the Air Power contribution to joint operations, as recognised by the German Luftwaffe, includes more than delivery

of weapons from the air. It also includes: Intelligence, Surveillance, Target Acquisition and Reconnaissance (ISTAR); airspace management; airlift; and engagement of targets from the air. In addition to supporting the Army, other components might benefit from these capabilities as well.

Joint Effective Engagement

When providing Close Air Support (CAS) the degree of force integration is especially high. This is due to the complex and fast changing ground situation that renders traditional, more procedural fire support coordination measures unsuitable. Furthermore, in contemporary operations, military forces have needed to adapt to a situation in which friendly, enemy and civilian personnel occupy the same battlespace. In these instances, coordination and deconfliction based on long range planning is insufficient. Most importantly, the need for synchronisation extends beyond the planning phase and into execution.

Sensors and effectors must be flexible and responsive to enable quick reaction to evolving situations. They must provide timely and accurate target information, achieving the desired effect whilst avoiding fratricide and minimising collateral damage. In complex and dynamic situations this requires appropriate C2-structures and procedures that enable the efficient and flexible use of limited resources such as fighter-bombers, attack helicopters or reconnaissance assets. All these requirements demand an extensive integration of the services' capabilities to enable forces to cooperate at the same time, in the same place, based on the best possible operational picture. One of the biggest enhancers for this joint integration is a networked approach built on thorough technical and procedural foundations.

Joint Fire Support C2 – Contribution and Responsibilities of the Air Force

During fire support, not only is it necessary to coordinate the fire of the delivery platform and the movement of the supported forces, but to deconflict the flight path of weapons (including its effects). This

includes artillery shells as well as other airspace users like CAS-aircraft or surveillance UAVs. During immediate requests for fire support, e.g. in 'Troops in Contact' situations, the situation is highly challenging requiring a proven and flexible process. To contribute to efficient planning, and to enable a quick response to urgent fire support requests, the STF-concept of the German Army provides C2-elements at different levels of command. The 'Joint Fire Support Team' (JFST) organised/attached at the company level, but supporting subordinate patrols, convoy operations, etc. is authorised to request fire support from fighter aircraft, attack helicopters, mortars, howitzers or, if available, naval gun fire. The team consists of a Forward Air Controller (FAC) who is either from the Air Force or Army, a Forward Observer and support personnel. The equipment available per team includes two armoured reconnaissance vehicles, target acquisition/designation devices and communication systems.

The Luftwaffe has deployed FACs to operations in a joint approach with the Army since the Balkans in the late 1990s. Until 2011, being a FAC was a secondary duty for personnel from flying and tactical air control units. However, by placing FACs in a (preliminary) air support unit, with the goal of transferring them to the Army's JFST, being a FAC has become their primary duty. The responsibility for basic and tactical training of all the German Army, Air Force and Navy FACs, including the standardisation of procedures, rests with the Luftwaffe. To improve training and to save resources the procurement of a mobile FAC-simulator was initiated.



The 'Joint Fire Support Coordination Team' at battalion level and the 'Joint Fire Support Coordination Group' (JFSCG) at brigade and division levels are coordinating elements. Within the JFSCG specialised sections are provided to assist planning and execution of joint fire support with the respective competences (artillery, Army aviation, naval gun fire, airspace management, air operations). The air operations section will mainly be responsible for coordinating the requests for Air Force sensors and effectors. The airspace management section will contribute to airspace coordination. This is of special importance when UAV, artillery systems, CAS-missions, Medevac helicopters, humanitarian assistance flights and civilian air traffic are conducting parallel operations in the same piece of sky. The German Army insists on having Air Force personnel in these sections for daily face-to-face coordi-

nation, improving mutual trust and communication. These personnel will act as the 'Front-end' for the Army's inputs to the respective processes. In case of extensive planning and coordination tasks or further demands that overtax the 'Front-end' personnel, the Luftwaffe intends to establish additional 'Back-end' capabilities in rear echelons providing reach-back functions comparable to that of an Air Support Operations Centre (ASOC).

ISTAR

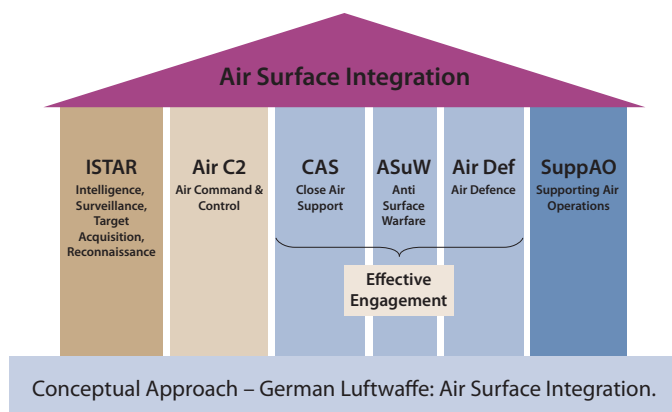
There is not only a growing demand for CAS but also for ISTAR support from Air Force platforms. Army and Special Forces increasingly take advantage of overhead



German AF Eurofighters in flight manoeuvres.

© Bundeswehr, Ingo Bicker





Air Force operated long-endurance UAS with Full Motion Video (FMV) capable sensors that improve their situational awareness and the overall operational picture. These capabilities mostly cannot be provided by tactical Army organic reconnaissance assets.

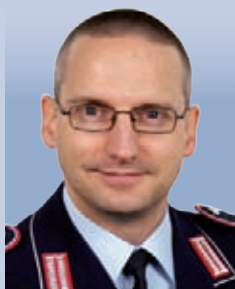
The operation of UAS in support of the other services raises multifaceted challenges for the Air Force. These comprise the build-up of sufficient combat ready UAS-operators, their integration into the C2-structure, the availability of an adequate communication equipment to make the data available and the development of procedures and prerequisites for operating UAS in dense airspace. Additionally, the Air Force's UAS-operators and their counterparts from other services need to conduct intense joint tactical training and exercises. Experience gained in UAS operations and steady development in technology and procedures will lead to synergistic effects. This will contribute to further improvement of a focused support to ground and naval forces and increase the capabilities of the UAS in the future.

Further Fields of Action in Integrating Joint Capabilities

The German Luftwaffe's conceptual approach to integrating its capabilities into joint operations was labelled 'Air Surface Integration' to emphasise it extends beyond the support of ground forces. Air Force capabilities providing effective engagement, ISTAR and Air C2 can contribute to the operations of all services. Suppression of Enemy Air Defence may be supporting operations of Navy and Army flying assets. Integration of airborne, ground based and naval air defence systems under the Air Defence Commander is a joint task as is the provision of operational and tactical airlift (including SOF). All these processes might be coordinated at the operational level of command but will require close joint interaction at the tactical level.

Conclusion

NATO's Air Forces have realised the necessity of an extensive but flexible integration of their capabilities into joint operations on a tactical level. The above mentioned conceptual approaches JFS, ALI or ASI help to align Air Forces' doctrine and procurement in line with the most current demands. A mandatory prerequisite for their success are personnel who think and act jointly, have a joint mind-set yet know the strengths, weaknesses and demands of the single services. To achieve this, joint education, training and exercises are of great importance. Strong and competent services are no contradiction in this process. They just have to make sure that old habits, including the fight for resources, do not dominate and preclude the joint capability growth. ●



Lieutenant Colonel Thomas Früh

completed officer and flight training and then was attached to Fighter Bomber Wing 33 as a TORNADO pilot. He was trained as a Forward Air Controller and deployed in that capacity in 1997 to Bosnia. After attending the General Staff Officer Course he served as Branch Chief, A3 Headquarters, 1st Air Division. At the German Ministry of Defense, Air Staff Division III, his duties include the responsibility for policy and conceptual work covering the German Luftwaffe's contribution to Joint Fire Support.

Challenges for NATO Air & Space Power

By Air Marshal Sir Christopher Harper, KBE MA FCMI RAF

Introduction

As the globe's pre-eminent security alliance, NATO must retain an ability to defend against the full range of threats that confront, and may confront, its members. In an ever-changing and unstable world these threats are many and varied, and robust strategic thinking will be required if we are to address them adequately. As NATO's new Strategic Concept¹ makes clear, this can be achieved by working more closely with other nations and organisations to promote international stability, and by ensuring that the Alliance retains the ability to manage complex crises as they emerge. The purpose of this brief commentary is to promote debate on how Air and Space Power can contribute to the achievement of these objectives and to encourage all military airmen to "brand and market" Air and Space Power with increased vigour and effectiveness.

Recognising the Importance of Space Power

"There will come a time, I think, when you may see the word 'space' in our title, and there may come a time when there is nothing but 'space' in our title."
General Howell M Estes III, Commanding General of USAF Space Command²

Space is the ultimate high ground. In the days of Wellington and Napoleon, high ground was defined by topography. But as we have ventured further into the Air and Space domains, we have been able to seize and exploit new vantage points which afford broader strategic and operational perspectives than would ever be available from the earth's surface. Arguably for this reason above all others, Space is an environment that can neither be ignored nor taken for granted. Nonetheless, and despite General Estes' assertion, it remains difficult to envisage a time when Air Power will be replaced by Space Power alone.



Wellington at Waterloo.

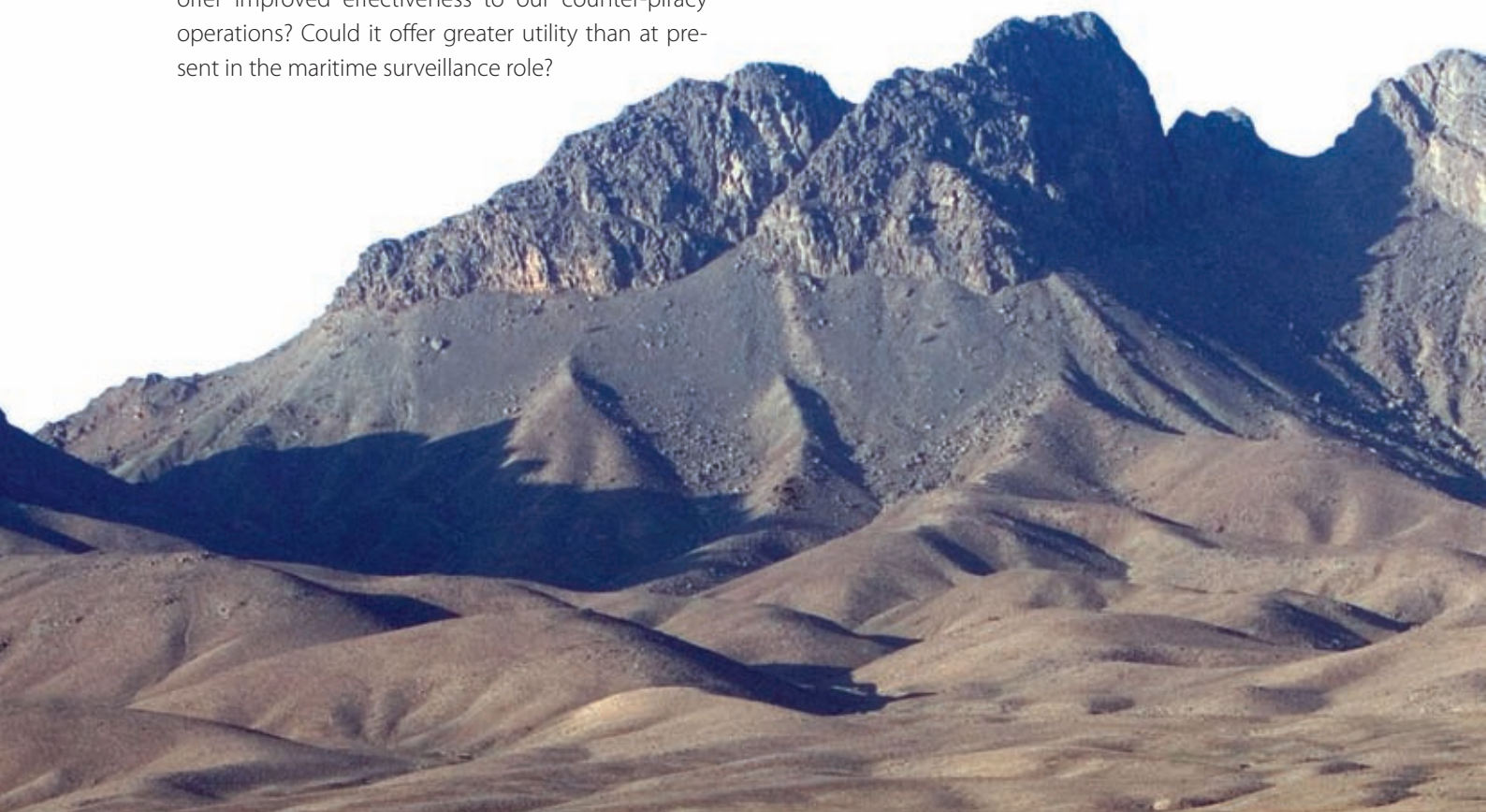
It is indisputable that Space has already permeated a great many aspects of the society in which we live. It has quietly transformed the commercial transportation, finance and logistics sectors and has reached out to touch much that we do in the military. Space has also become a key enabler in the operational prosecution of campaigns. Precise position, navigation and timing reference from space is now commonplace; through it we have witnessed a transformation not only of weapon delivery (with a concomitant reduction in the risk of collateral damage), but also of our all-weather capabilities.

Space is, furthermore, the operating environment for many critical assets in the fields of Intelligence, Surveillance and Reconnaissance, satellite communications and networks. Space-based assets offer theatre commanders access to high quality, fused battlespace awareness as well as providing high-density secure communications to both plan and execute their campaigns. One does not need to cast one's mind back very many years to be able to see how nearly every Air Power role has been strengthened in some way by access to Space. Thus the criticality of assuring that access really cannot be over-stated.

But while Space has become a powerful (and expensive) aspect of all NATO operations, we must question whether we are adequately exploiting the advantages it has to offer? Might Space, for example, be able to offer improved effectiveness to our counter-piracy operations? Could it offer greater utility than at present in the maritime surveillance role?

There would also seem to be a pressing need to determine how we might better integrate Space Power, and thinking on Space, into NATO's structures and long-term plans. The cost of most space systems places the acquisition of national assets beyond all but a few nations. We need to explore areas such as integrated data-sharing and collective space assurance to ensure that NATO is offered the most cost-effective means of gaining and retaining the vital 'high ground.' In addition, we must recognize that NATO currently suffers an acute shortage of dedicated Space expertise (fewer than ten Space positions on the International Staffs). This seems unrealistic; we need quickly to grow the Alliance's space expertise. If we can, we would better leverage Space-based capability and thus enhance the likelihood of our achieving future operational success. In the aftermath of the 2010 Lisbon Summit, as the Alliance looks to its new and emerging roles and missions, the importance of Space has started to be recognized. This is particularly germane in the area of Missile Defence but other areas will follow.

NATO's Heads of State and Government have embraced the concept of 'Smart Defence'. The notions that we will *ensure the maximum coherence in defence planning* and that we will, *develop and operate capabilities jointly for reasons of cost effectiveness*³, seem especially apposite when applied to the Space domain.



We must, moreover, work hard to ensure that the new NATO Command Structure properly incorporates the appropriate level of Space expertise.

Air Power – Some Contemporary Challenges

“Air is our strategic advantage but it can become our strategic vulnerability if not employed with restraint and precision.”

General Stanley McChrystal, 24 Aug 09

While both cautionary and promoting of the utility of Air Power, General McChrystal reminds us that understanding of Air Power’s strategic significance is not limited to airmen. The delivery of accurate kinetic effect remains a cornerstone of military Air Power. Yet we must be alive to the fact that our adversaries are increasingly adept at media exploitation and, because they are often not constrained by the need for accuracy and truth in their reporting, they can exploit even the smallest of our misfortunes to their advantage. We should not allow such factors to drive us away from employing Air Power offensively. It has already proved insufficient merely to rebut false allegations. Instead, while constantly seeking to improve the accuracy, assuredness and proportionality of kinetic air operations, we should increase our capacity swiftly to inject unambiguous and factual information into the public domain. Arguably more importantly, we need to take every opportunity to place the Air Power narrative

upfront prior to the start of operations. We then need to revisit it frequently to ensure that the multitude of target audiences continues to understand its contribution and relevance.

In addition, neither we nor our sister component, should forget that Air Power pervades both Land and Maritime environments and that it is essential to conducting successful Joint operations. First and foremost, we must be able to guarantee freedom of action through maintaining control of the air. The earliest Air Power practitioners recognised that without this vital condition, operations would always be conducted at a disadvantage. But we must accept that traditional views of control of the air may need to be expanded. For example, some still hold the perception that control of the air revolves around fighter vs fighter combat of a nature not recently seen. This has led to dangerous siren voices suggesting that this crucial capability is obsolete and that the range of assets required for the role are an expensive luxury. We should be ready to counter this simplification by recognising that we are witnessing an evolution, where our opponents will seek to contest control of the air in a variety of different ways. Adversaries who lack fighters or sophisticated integrated air defences instead attempt to constrain our actions, particularly below 10,000 ft, by utilising whatever means they have at their disposal. The enemy always ‘has a vote’ in the control of the air contest. And, while in contemporary operations we face relatively unsophisticated technology such as small arms fire and man portable surface-to-air missiles, we must not be seduced into believing that this will forever be the case. It is a sad fact that many of the states from which future security challenges might emerge possess formidable integrated air defence systems and highly capable fighter aircraft.

In the past, high ground was defined strictly by topography.

Field Marshal Montgomery's observation that 'if we lose the war in the air, we lose the war and we lose it quickly' remains as valid as ever. Without control of the air, our operations will *always* be constrained.

Air and Space Command and Control (C2)

When examining the topic of Command and Control, Marshal of the Royal Air Force Lord Tedder offers a superb example of an airman who was master of his own environment while also being a model Joint officer. Having worked alongside Montgomery in North Africa he was appointed Deputy Supreme Allied Commander during the liberation of Western Europe in 1944–45. His deep understanding and total belief in the efficacy of Joint warfare was evident in the effective air-land integration during both these important phases of World War II. Tedder's effectiveness was underpinned by his grasp of both Air Power principles and broader military strategy.

Tedder contended that war was "a single problem in which the strategy, the tactics, and the techniques of sea, land and air warfare respectively are inevitably and closely interlocked". This creates a situation in which "air warfare cannot be separated into little packets", as "it knows no boundaries on land and sea other than those imposed by the radius of action of aircraft; it is a unity and demands unity of command"⁴. This is one of the most important aspects of our profession and one which every Air Power practitioner must continue to embrace. There are those who, even now, call for 'penny packeting' of air assets, but this undermines the ability to apportion Air Power where most needed and to greatest effect. By upholding Tedder's axioms we are not failing to appreciate the importance of co-operation, but rather demonstrating our recognition that the foundations for operational success lie in coordinated, co-operative effort with our sister Services. As Tedder observed, "Given mutual understanding ... you get mutual faith: and only with mutual faith will you get the three arms working together as one great war machine."⁵

Perhaps then, we should ponder whether NATO, in the military operations in which it has been involved, has ever got this integration piece exactly right? And



Marshal of the Royal Air Force, Lord Tedder.

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without suggesting that the Alliance's end results have ever been poor, one might ponder whether the right lessons have always been applied? So, as we approach a period where financial stringency will demand optimal operational efficiency, we must work doubly hard to ensure that neither the doctrinal nor the language differences that exist between the NATO nations⁶ affect our interoperability. It is, after all, interoperability which will be the *key* to optimising Air Power in the multinational environment. Common Tactics, Techniques and Procedures and a wide-range of exercises and training opportunities will be vital in retaining key capabilities and ensuring that all 28 nations are on the same 'squadron frequency'. We should, therefore, also remain alert to the risk that exercises and training may be perceived as a low priority when competing for scarce funding. Yet, the message should be clear: if we cannot interoperate then we *cannot operate*, at least not to best effect. Large-scale exercises bring costs, but the cost of *not* conducting them will create serious problems. The opportunity to "get integration right" is with us, here and now, as we

develop plans for NATO's new Command Structure, its links to the NATO Force Structure and the preparation, validation and certification of all its constituent parts. We must not squander it. To repeat an earlier point, we must also ensure that Space Power is afforded its rightful place in this construct.

Conclusion

"People can foresee the future only when it coincides with their own wishes, and the grossly obvious facts can be ignored when they are unwelcome."

George Orwell, Dec 1944

As the Lisbon Summit Declaration notes, "NATO will be more agile, more capable and more cost-effective [in the future], and it will continue to serve as an essential instrument for peace". As proponents of Air and Space Power, we need to be equally visionary and act now to ensure that important messages concerning Air and Space continue to shape the military instrument of the future. There is, of course, the perennial problem of visualising the exact nature and scale of future conflict. To rephrase Orwell, it would be folly to claim absolute precision in any attempt to envisage the future battlespace. But one thing is clear – those who believed that counter insurgency or counter terrorism would be our *only* future focus have already been proven off beam by *inter alia* the advent of the campaign in Libya. The multiplicity of plausible and serious potential threats in our increasingly unstable world is, moreover, of increasing concern. So, while attempting to emulate Tedder's enviable approach to



A training camp in Afghanistan.

jointness, it is incumbent on all professional airmen to be able to articulate in clear, precise terms that a capable, agile, flexible and versatile Air and Space component, able to adapt and react swiftly to any given circumstance, will be an essential component of NATO's foreseeable future. ●

1. Active Engagement, Modern Defence. The Strategic Concept for the Defence and Security of the Members of the North Atlantic Treaty Organization. Adopted by Heads of State and Government at the NATO Summit, Lisbon, 19–20 November 2010.
2. John A. Tirpak, 'The Rise of Space', *Air Force Magazine*, August 1997, p. 55.
3. Active Engagement, Modern Defence. *Op Cit*. Reform and Transformation. Para 37.
4. Marshal of the Royal Air Force (MRAF) Lord Tedder, *Air Power in War* (London: Air Ministry, 1947), p. 11.
5. MRAF Lord Tedder, 'Air, Land and Sea Warfare', *RUSI Journal* Volume 91 (1946), p. 64.
6. US Air Force Doctrine Document 1 (AFDD 1) distinguishes seventeen Air Power Functions compared with just four in British Air & Space Power Doctrine (*AP 3000* Vol 4).



Air Marshal Sir Christopher Harper

has flown the Jaguar aircraft and, on exchange to Canada, the CF-18 Hornet. He has commanded No 41(F) Squadron, RAF Coltishall and RAF No 1 Group.

Sir Chris' staff appointments have included Director of Joint Commitments in the MOD and Chief of Staff (Operations) at HQ Air Command. On promotion to Air Marshal, Sir Chris became DCOM at JFCHQ Brunssum. He was appointed as the UK MILREP to NATO and the EU in March 2011.

A graduate of King's College London, Sir Chris was mentioned in despatches for involvement in air operations over Iraq in 2001 and was knighted in the 2011 Queen's birthday honours list.



Maritime Interdiction is conducted during The Multi-National Exercise FRUKUS 2011.

Command and Control – Exploring Alternatives

The Realities of Two C2 Models for Air Power Proponents

By Lieutenant Commander Dave Ehredt, USA N, JAPCC

Proponents of air power rely heavily on the Centralised Control – Decentralised Execution (CCDE) Command and Control (C2) Model as the single most effective and efficient method for the employment of air power. Consider NATO Publication AJP-3.3(A), Allied Joint Doctrine for Air and Space Operations, which states, “To achieve the strength of unified air action and to ensure that the capabilities of air power are used as the overall situation demands, the following key principles apply: (a) centralised control; (b) decentralised execution; and (c) strategy-to-task.”¹

Under the first principle, Centralised Control, AJP-3.3(A) adds that, “Centralised control places the responsibility and authority for planning, directing and coordinating air capabilities with a single commander.”² Further, cen-

tralised control, “maximises operational effectiveness and avoids duplication of effort.”³ No mention of any other C2 Model can be found in AJP-3.3(A).

The language of AJP-3(B), Allied Joint Doctrine for the Conduct of Operations, focuses to a much greater extent on the incorporation of non-NATO states and non-military actors into the overall C2 structure. Nonetheless, AJP-3(B) states that, “Operations are normally characterised by centralised planning and direction to achieve unity of effort, whereas authority for execution should be decentralised.”⁴

Perhaps CCDE is the best C2 Model, but this article argues that NATO military planners may not always have the luxury of choosing one C2 Model over

another. Because of the number of state and non-state actors, and the number of non-member nations who may choose to contribute forces to an operation, NATO cannot always choose its preferred C2 Model. Two current military operations illustrate the point.

Counter-Piracy Operations off the Horn of Africa

The three major Counter-Piracy operations off the Horn of Africa are Operation OCEAN SHIELD (NATO), Operation ATALANTA (European Union), and the multinational Combined Task Force 151 which has consisted of forces from 20 nations, many of which are not linked to any multinational organisation such as NATO or the EU. Non-NATO Nations who have contributed military forces to Counter-Piracy operations off the Horn of Africa include China, Russia, Pakistan, India and even Iran. Among all of these operations and contributions by individual nations there is no single chain of command. Without a single commander responsible for the over-arching mission, it is impossible to have centralised control. The CCDE Model does not exist in Counter-Piracy operations off the Horn of Africa, and, based on the actors involved, it probably never will. Perhaps this is one reason why NATO air assets have been so hesitant to get involved despite repeated requests by commanders at sea for air support.

Nevertheless, some air assets are flying in support of Counter-Piracy operations and are doing-so without the CCDE Model in place. At best, as Gp Capt Bennington, previous Chief of Staff to COM MAR AIR Northwood, wrote in 2010, the nations involved in Counter-Piracy operations off the Horn of Africa are operating as a Community of Shared Interest (COSI).⁵ The nations involved in Counter-Piracy have created several tools to improve communication among the disparate operations and nations, such as Shared Awareness and

Deconfliction meetings, an Air Coordination Element, and Mercury, a password-protected website for information sharing. Although NATO has been contributing forces to Counter-Piracy operations for nearly three years, the C2 Model within which those forces are operating is not represented in NATO's Air and Space Operations doctrine.

Libya

Operations in Libya are presently being conducted by NATO using the CCDE Model under Operation UNIFIED PROTECTOR. It may be easy to forget that this was not always the case. When military action began on 19 March 2011 the initial coalition consisted of many NATO member nations, including Belgium, Canada, Denmark, France, Italy, Norway, Spain, the U.K. and the U.S., but also included non-NATO member Qatar. At the outset there existed four separate official operations by individual nations: Operation HARMATTAN (France); Operation ELLAMY (U.K.); Operation MOBILE (Canada); and Operation ODYSSEY DAWN (U.S.). Not until 31 March 2011 did NATO accept C2 of all military operations in Libya. During the 12-day interim period, however, Centralised Control was not possible. While it goes beyond the scope of this short article, one could further argue that these 12 days were the most crucial for Air Power as it fought to achieve control of the air and seize the initiative. Air Power from many nations



A US Naval Officer highlights tracks of interest on the E-2C Hawkeye.

© U.S. Navy, Photographer's Mate 1st Class Jim Hampshire

muddled through these 12 days with extensive use of liaison officers acting as communication conduits between the four major operations. While the situation was not ideal, and while the use of the CCDE Model may have resulted in a more-effective use of Air Power during those 12 days, its implementation was not possible. NATO members were in staunch disagreement during that time about whether or not the Alliance should be involved. Furthermore, NATO is not known for its speed or agility when responding to an international crisis, something which is unlikely to change in the near future. Therefore, Air Power advocates must realise that implementation of the CCDE Model will not always be possible during all military operations, particularly during the initial phase as was the case with operations in Libya.

Community of Shared Interest – An Alternative C2 Model

The only C2 Model referenced in AJP-3.3(A) is the CCDE Model. Where this piece of NATO doctrine fails is that, by omitting any mention of an alternative C2 Model, it claims that CCDE is the only C2 Model capable of achieving mission objectives. Initial operations in Libya and current Counter-Piracy operations off the Horn of Africa show that there is a feasible alternative to the CCDE C2 Model: the COSI Model.

If centralised control is one of the three key principles for effective air operations as stated in AJP-3.3(A), then how were nations capable of engaging in Libya at the start of operations, and how are nations currently engaging in Counter-Piracy operations off the Horn of

Africa without this key principle? The answer is that they are relying on liaison officers and other methods for communicating their intent and coordinating their efforts. They operate as a COSI. Current operations show that the battlespace is becoming more complex with various state and non-state actors, some of whom do not belong to previously established organisations or alliances such as NATO or the EU. There is little doubt that future operations will be conducted under circumstances in which the CCDE C2 Model cannot be implemented. Yet there exists no alternative C2 Model in AJP-3.3(A) besides CCDE. This article argues for incorporation and discussion of alternative C2 Models in doctrine, namely the COSI Model, since it is not only possible to conduct air operations without the CCDE Model, but necessary.

Conclusion

This article does not propose that air power proponents curb their enthusiasm for the CCDE Model, but it argues that alternative C2 Models, particularly the COSI Model, must be addressed within nations' and NATO doctrine, and consequently in military school houses around the world. This will ensure military officers are adequately prepared for operational realities in which the CCDE Model cannot be implemented and operators are forced to conduct operations within the constraints of an alternative C2 Model. ●

1. NATO AJP-3.3(A), *Allied Joint Doctrine for Air and Space Operations*, November 2009, p. 1–4.

2. *Ibid.*

3. *Ibid.*

4. NATO AJP-3(B), *Allied Joint Doctrine for the Conduct of Operations*, March 2011, p 1–12.

5. 'Counter Piracy: Encouraging Air and Space Synergy', *Transforming Joint Air Power, The Journal of the JAPCC*, Edition 11, p 30.

Lieutenant Commander Dave Ehredt

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





Two Italian Air Force T-346A aircraft performing local formation training.

Italian Flying Training

In Pursuit of Excellence

By Lieutenant General Pasquale Preziosa, Commander, ITA AF Training Command

Within the last decade, the challenges brought on by world changes, the increased involvement in joint or combined operations, the rising role of new battlefield technologies and the reduction in economic resources require a more effective and efficient Air Force than in the past. Advanced pilot training is a key element in delivering this and is an area where integrated Italian training excels.

The current mission of the Italian Military Air Force School is to educate and train top-quality military pilots in a modern context characterised by the following:

- The ability to operate with the support of a logistic system integrated with the current social and economic reality;

- NATO and international integration;
- The ability to be flexible and versatile;
- Quick reaction deployment in areas of primary and non-primary interest.

To better understand the training of an Italian pilot, it is necessary to briefly summarise the entire training process of a student. The concept of Italian Air Force Flight Training is divided into three fundamental stages: Knowledge acquisition (basic and advanced); Skills acquisition (basic and advanced); and 'Airmanship' consolidation, which includes leadership, flexibility and mission management.

Training begins with student aptitude screening linked to 20¹ missions, performed on the propeller-driven Aermacchi T-260 (70th Wing in Latina). During

this period, in addition to teaching basic visual flying techniques, the aim is to identify 'the right person in the right place'. Due to high operating costs in equipment and personnel, this selection phase is extremely important in identifying the best students to continue in advanced stages of training. In order to reduce the attrition rate, selective computer tools, such as the PILAPT (Pilot Aptitude Test), are used. This tool, though interesting, has limited value as it is only able to identify the student's basic flying aptitude and no other essential capabilities, such as motivation, G-force tolerance, etc. The PILAPT can only be considered valid if associated with flight selection. Once screening is accomplished, the student moves to Phase I and II on the same aircraft. These phases consist of 90² missions, the aim of which is to improve visual flying and give adequate training in order to handle the aircraft during aerobatic manoeuvres and emergency situations.

Phase III switches to the Aermacchi T-339 A/CD aircraft at the 61st Wing in Lecce and consists of 100³ missions. The aim is the achievement of the Military Pilot Wings for all different flight lines. This phase completes the previous training and produces an aviator able to operate in an operational – integrated environment. At the end of the first three phases, the young aviators will be aware of the mission manager role and its importance during complex air missions.

The final phase, Phase IV, also conducted in Lecce AFB, consists of 70 missions specifically designed for students assigned to tactical aircraft. This phase focuses on the transition to a combat environment and covers part of the syllabus previously delivered by the Operational Conversion Units (OCUs). It is important to note that one of the strong points in Phase IV is the opportunity to train on high performance aircraft, such as the T-339 CD, complete with up-to-date avionics and in-flight refuelling capability. Also, in the future, Phase IV will train students on the T-346; unique in its ability to simulate 5th generation aircraft from both an avionics and handling perspective.

In parallel, what really covers the needs of the student is the complete simulation tool to include ground based recording coupled with a flight analysis system. The decision to acquire an advanced high performance

trainer is the result of political, economic and strategic goals. Due to the general reduction of resources, modern Air Forces are continually reorganising. Operational commitments, especially outside national borders, can lead to a significant impact on the resources devoted to the Military Educational Department. The immediate consequences could be the potential reduction of operational training quality and the ability to achieve the necessary experience in-flight. Based on the above, an evaluation is being made to determine if first-line aircraft (Typhoon, Tornado, Rafale, etc.) are necessary to achieve 'Combat Readiness' requirements.

From a cost efficiency point of view, using 5th generation fighter aircraft to train new pilots in basic combat training, flight instrument work or G-force tolerance doesn't add up. It becomes necessary, therefore, to find innovative solutions and develop advanced training in order to remove from the burden of operational units those activities that are more economical and



acceptable if performed in flight training schools (In-flight refuelling, Basic Fighting Manoeuvres (BFM), Advanced Fighting Manoeuvres (AFM), shooting-range etc.). In the near future, the expansion of Phase IV is conceivable by working on pilots' 'skills' and performance not directly dependent on a specific front line aircraft. This training could possibly lead to a 'Limited Combat Readiness' designation within the Air Training Command Flying School. Obviously, such a goal can be achieved only through a proper integrated system support which has to be based on modern ground and in flight training. In particular, it will need specific and long range investments. It's important to note that the T-346 MASTER is the only new generation trainer available on the global market that fits the above requirements. Aerodynamics, along with an advanced 'fly by wire' design, allows the aircraft to remain fully controllable at extremely high angles of attack, matching most of the last generation fighters' performances. The use of a twin engine configuration, together with a thrust-to-weight ratio close to 1.00,

guarantees flight safety levels never obtained before. Current avionics, along with 'fly-by-wire' technology, replicate the majority of 5th generation aircraft on the market. The T-346 MASTER trainer is a one-of-a-kind aircraft.

“The reputation and credibility of the Italian Air Force School continues to grow, as reflected in numerous countries showing interest in Lecce AFB. Many foreign delegations, who have visited our Schools, have signed, or are in the process of signing, an agreement.”

The reputation and credibility of the Italian Air Force Flying School continues to grow, as reflected in numerous countries showing interest in Lecce AFB. Many foreign delegations, who have visited our schools, have signed, or are in the process of signing, an agreement. Arrangements and various training activities are already well established with France, Greece, Spain, Argentina and Austria. Future projects are underway with Algeria, Djibouti, Malta and Zambia. Internationalisation, especially at the 61st Wing in Lecce, is already a reality.

Internationalisation, however, is not just exclusive training for pilots from other nations on Italian aircraft. It is also an exchange process, a partnership synergising the contributions of participants to a 'joint training program'. Indeed, the current programme reflects a recently revised high quality syllabus created after a comparative study with other military air forces in conjunction with operational departments of various units. In addition, it is important to highlight the prolific cooperation with the U.S. Air Force Air Education and Training Command (AETC) at Sheppard AFB, Texas. The combined school in Lecce has high standards and continuously updates its training techniques through an interactive, continuous and synergic process between all elements. From a logistical point of view, the 61st Wing has the capacity to host all foreign visitors with room to expand in the near future based on modern programme initiatives. Base infrastructures are suitable to accommodate students from countries with different cultures and religions. Salento, the county where Lecce AFB is located, is a receptive, touristic



Italian Air Force student practices air-to-air refuelling on the flight simulator.



and cultural area that meets all requirements of a good host. From a flight operations perspective, Lecce AFB offers numerous advantages for visitors. Lecce AFB boasts ample availability of airspace, excellent weather conditions and first-rate socio-economic integration within the region. All allow for favourable flying activities.

In summary, the advantages of the flight training school in Lecce are:

- Training consolidation based on 60 years of activity;
- Internationally acknowledged professionalism, a pillar of excellence;
- High quality training programs;
- Presence of an exclusive advanced trainer, a new concept, accessible on the market (T-346);
- Airspace availability;
- Excellent weather conditions;
- Cost reductions resulting from downloading OCU training activities.

Conclusion

It is important to highlight the relevance of these investment choices in flight training which, in times of economic hardship, could be criticised or deemed unnecessary. We should keep in mind that today's seed is tomorrow's tree and that maintaining or even increasing the quality in basic training, when viewed in future perspective, is a choice that pays off. International scenarios, conflicts and ethnic tensions are becoming increasingly difficult to predict, while the global economic crisis requires financially responsible decisions. The Italian Air Force considers flight schools a key component in maintaining Air Power effectiveness. The goal is to turn an already good product into one of unique quality, based on logistics, programmes and personnel through means of absolute excellence. ●

1. In some exceptional cases the number of sorties can be increased by a limited number of missions to fit some marginal situations and help formulate a more precise evaluation of the students.
2. Ibid.
3. Ibid.

Lieutenant General Pasquale Preziosa

joined the ITA Air Force Academy in 1971. He logged more than 2,300 hours in the F104 Starfighter as a fighter bomber pilot and as an IP in the Tornado in Cottesmore (UK). He was Commander of the 156th Squadron in 1987 and the 36th Wing in 1994.

As a General, he held Chief positions in the Defence General Staff, Budget General Planning Department and served as IT SNR in the 'Enduring Freedom' Response Cell in Tampa (USA). He was appointed as the Defence and Defence Cooperation Attaché in Washington D.C. and, since Apr 2010, been the Commander of the ITA AF Training Command and the 3rd Air Region. Lt Gen Preziosa holds master's degrees in International Diplomatic and Aeronautical Sciences. He received the prestigious NATO and National medals, the Legion of Merit from the United States, and the Eagles' Gold Medal, First Grade, from the Albanian Republic. He's married to Elisabetta and has two daughters.





British Harrier operating off the deck in 1982. The Falkland War represents a good example of Maintenance of the Aim principle application.

The Principles of War

Back to Basics?

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

Introduction

Since the Kosovo air campaign in 1999, and in subsequent operations, the effectiveness of air power and its ability to accomplish the operational objectives has been the subject of constant debate in military circles. The intrinsic value of air power, and its contribution to its own and other components, is not in question; indeed one must consider the effect if air power was missing. However, what is questionable is whether air power has been employed in the proper manner in order to maximise its effects and minimise its limitations.

The Principles of War, in the format we use widely today, were first defined by Maj Gen John Frederick Charles Fuller at the end of the First World War and have remained almost unchanged since then.

Purpose

The purpose of this article is to provide food-for-thought with respect to the use of Air Power, during recent conflicts, by contrasting its employment against the Principles of War. Whilst there are some minor differences in National doctrine (see Table on page 46), the NATO definition of the Principles of War have been used as the reference for this article. Allied Joint Doctrine¹ describes the following Principles: Definition of Objective, Unity of Purpose, Sustainment, Concentration of Force, Economy of Effort, Flexibility, Initiative, Maintenance of Morale, Surprise, Security, Simplicity and Multinationality. AJP-01(D) further states that, although all of them are applicable during operations *“these principles are not absolute”* and *“the operational situation may demand greater emphasis on some more than others.”* This is true in the

NATO AJP-01(D)	US AFDD-1 ³	UK AP-3000 ⁴	CA B-GA-400-000 ⁵	SP IG-00-1 ⁶	JFC Fuller
Objective	Objective	Aim	Aim	Objective	Objective
Unity of Purpose	Unity of Command	–	–	Unity of Effort	–
Sustainment	–	Sustainability	Administration	–	–
Concentration	Mass	Concentration	Concentration	Concentration	Mass
Economy of Effort	Economy of Force	Economy of Effort	Economy of Effort	Economy of Effort	Economy of Force
Flexibility	Manoeuvre	Flexibility	Flexibility	Manoeuvre	Movement
Initiative	Offensive	Offensive	Offensive	Offensive	Offensive
Morale	–	Morale	Morale	Will to win	–
Surprise	Surprise	Surprise	Surprise	Surprise	Surprise
Security	Security	Security	Security	Security	Security
Simplicity	Simplicity	–	–	–	–
Multinationality	–	Cooperation	Cooperation	–	Cooperation

case of the Allied Joint Doctrine for Non-Article 5 Crisis Response Operations (CRO)² which both expands upon the definition of some of the principles (Objective, Unity of Effort, Initiative and Security) and adds to the list (Consent, Restraint in the Use of Force, Perseverance, Legitimacy, Credibility, Mutual Respect, Transparency and Freedom of Movement).

One may conclude, from a doctrinal point of view, that Fuller's Principles of War are as valid today as they were in the past and their applicability covers all domains of warfare, including air power, at all levels from strategic to tactical.

The NATO-led operations analysed within are: Operation Allied Force (Kosovo), the International Security and Assistance Force (Afghanistan), Operation Ocean Shield (Horn of Africa) and Operation Unified Protector (Libya); the latter three still on-going. These operations represent a broad spectrum of air power employment in different geographic, topographic and climatic environments. The Kosovar and Libyan operations were/are primarily air campaigns against conventional forces whereas Air has played a supportive role to land-centric operations in Afghanistan and maritime-centric operations (including the littoral) in the Indian Ocean; the latter two operations against asymmetric forces.

One should consider whether the Principles of War have been applied correctly, or considered in sufficient depth, during the planning and execution of the aforementioned operations? Or vice versa, has air power been employed in accordance with the Principles of War? The answers may question whether the extant of

the Principles of War are still valid or do they require changing to reflect current and emerging nature of warfare? What is more certain is that at the tactical and operational levels the Principles of War are applied in most circumstances. What is less certain, and perhaps critical to overall mission success or failure, is whether they have been applied at the strategic level.

Application of Principles

One could argue the **Definition of objective and its maintenance** have not been achieved in the aforementioned conflicts. Evidence of this is found in the different nations' understanding of elementary concepts such as mission purpose, desired end-state, mission accomplishment or exit criteria. This may be due to vague (perhaps deliberate) or inaccurate political decisions (e.g. UN resolutions) which are not easily translated into commonly understood military objectives. In Operation Unified Protector the explicit mission "to take all necessary measures ... to protect civilians and civilian populated areas under threat of attack ..." could be interpreted as implying alternative end states to the operation, to perhaps include regime change. This ambiguity in the objectives has undermined the **Unity of Purpose** (Unity of Effort and Command) with a resultant number of non-participating nations, a myriad of national caveats and red cards. This has resulted, as experienced during Operation Allied Force, in the highest priority objective being Alliance cohesion rather than effort directed against the opposing force. Unity of Purpose is also weakened by parallel operations with separate chains of command; Operation Enduring Freedom

(US National) alongside ISAF, Operation Atalanta (European Union-led) alongside Operation Ocean Shield; and the use of dual ATO (Air Tasking Order) in the same operation (Operation Allied Force).

The **Concentration or Mass** means to have decisive force at the decisive time and place. This principle, transposed to the strategic level, is employed in the Combined Joint Statement of Requirements (CJSOR) process, where nations offer their assets to the operation. Of course Operational commanders are continually requesting capabilities: in the counter-piracy Operation Ocean Shield there are no AWACS or ISR assets and insufficient Maritime Patrol Aircraft for the task; there are insufficient numbers in Air Transport and Rotary Wing platforms supporting ISAF; and there is a shortage in numbers of UAS supporting Operation Unified Protector. There are clearly shortfalls in some fielded capabilities which would be magnified without the enormous contribution of US Forces. NATO suffers from an overreliance on the United States and, without these assets (especially Space, AAR, Strategic Air Transport and some aspects of SEAD (Soft Kill)), the lack in the concentration of forces between the European member nations would be brutally exposed.

Lessons Identified (apparently not Lessons Learned) from Operations Allied Force and Unified Protector, separated by some 12 years, highlighted the difficulties NATO had in providing personnel to populate the CAOCs (Combined Air Operations Centre) and in providing the proper infrastructure. Operations in Afghanistan, with a lack of inter-theatre and intra-theatre Air Transport assets, exposed the huge shortfalls in NATO's deployment and movement capability. It is clear NATO has not adhered sufficiently to the principle of **Sustainment**, encompassing logistic and personnel support, and which continues to prove a nightmare to the Alliance.

One may conclude that **Surprise** and **Initiative** were not properly considered in the analysed operations. Both principles are highly inter-connected with the **Offensive** (both kinetic and non-kinetic) capability of air power. Yet, in both Operations Allied Force and Unified Protector, Air has been employed within escalating,

limited-response strategies and has been constrained in the selection and availability of targets. However an escalatory approach often results in a reactive rather than proactive stance, handing the initiative to the opposing force and perhaps prolonging the conflict unnecessarily. This is again evidenced in the ISAF mission and Operation Ocean Shield in which air power is employed reactively, within a defensive posture, with almost no attempt to take the initiative, whilst the insurgent or piracy networks appear relatively proactive. For air power to be at its most effective it requires to be employed in high concentration, at its maximum *Offensive* force and against the opposing centres of gravity, as demonstrated by the concept of 'Shock and Awe'.

Flexibility has long been considered as one of the major characteristics of air power. This inherent flexibility has, in recent operations, been able to overcome the constraints demanded at the political level. Tactics, Techniques, Procedures (TTPs) and equipment have unquestionably advanced in order to comply with these constraints however air power is in danger of falling victim to its own success. Factors such as collateral damage, deliberate and dynamic targeting (operations in Libya and Afghanistan) are all considered with extreme care but can be assessed and adapted within minutes as the situation dictates. Despite unfortunate mistakes, air power is fast approaching the 'perfect war' in terms of target identification, surgical effect, damage limitation and responsiveness. Paradoxically, this high degree of flexibility to adapt has led, and is leading, the political level to demand ever greater levels of precision (and fewer mistakes) by placing more-and-more restrictions upon air power. Thus rigidity at the political-strategic level is limiting the full effectiveness of air power employment, with the potential risk of prolonging air campaigns (Operation Allied Force took 72 days and Operation Unified Protector has exceeded 120 days at the time of writing) which may increase the numbers of casualties and displaced persons. The dilemma faced now is how to resolve the rigidity and inflexibility imposed at the strategic level versus the flexibility of air power at the operational and tactical levels. It would appear that strategic level thinking, mindful of public opinion, would rather accept the gradual, escalating and surgical air campaign rather than a short, decisive, concentrated and coercive option.

Multinationality and Legitimacy are prerequisites to CROs. There are very few nations with full spectrum military capabilities who can undertake operations in isolation. A NATO-led coalition adds political consensus to the military action and can also morally oblige other nations to participate. This consensus is further supported through UN resolutions which can provide the legitimacy to invoke military options. However, multinationality is based upon *cooperation* and comes with significant drawbacks including the differing national perceptions on the degree of cooperation and the possible impact on how operations are executed. With some nations more committed than others, a two or three tier NATO creates a lot more internal friction within the Alliance and adds to the complexity during the execution phase. The reliance on the United States in some capability areas (e.g. ISR, AAR, MPA, strategic airlift and space assets) highlights the lack in burden sharing amongst, particularly, European NATO nations when the US supports rather than leads the operation (Operations Ocean Shield and Unified Protector). Whilst the presence of other non-NATO coalition members is convenient from a political perspective, the issues of military interoperability and theatre entry standards have to be addressed otherwise the **Simplicity** and **Security** principles, at the operational and tactical level, may be compromised.

Conclusion

It would appear air power has neither been employed in full accordance with the doctrinal Principles of War nor to its maximum extent. It would appear, however, there are two general positions. First, the current Principles of War are no longer valid (or at least not valid in CRO due to the political constraints and restrictions

associated with this type of operation). This being the case, the Principles should be reviewed and new rules applied. Second, the current Principles are valid but we (the military) have failed to apply them correctly or have failed to educate the politicians and the wider public as to the employment, virtues and limitations of air power. It is left to the reader to decide.

References:

Cordesman, Anthony H. Lessons and Non-lessons of the Air and Missile Campaign in Kosovo Greenwood Publishing Group, 2001.

Meilinger, Phillip S. 'Principles of War for a New Century'. Air Power, Insurgency and the War on Terror. Edited by Joel Hayward. 2009.

Christopher Paul, Colin P. Clarke, Beth Grill. Victory Has a Thousand Fathers. Sources of Success in Counter-insurgency. RAND Corporation. 2010.

Ehredt, Dave. 'Strategy Versus Capability: The Non-contribution of NATO Air and Space Power to Counter-Piracy'. The Journal of the JAPCC. Edition 12. 2010.

Kainikara, Sanu. Principles of War and Air Power. Paper Number 31, Air Power Development Centre. 2011.

European Air Chiefs EURAC. 'Air Power Paper 2005'. 2005. ●

1. AJP-01(D) 'Allied Joint Doctrine' dated 2010.
2. AJP-3.4(A) Ratification Draft 'Allied Joint Doctrine for Non-Article 5 Crisis Response Operations' dated 2010.
3. USAF AFDD-1 'Air Force Basic Doctrine' dated 2003.
4. AP-3000 'British Air Power Doctrine' Fourth Edition dated 2009.
5. B-GA-400-000/FP-000 'Canadian Forces Aerospace Doctrine' dated 2010.
6. Ejercito del Aire IG-00-1 'Doctrina Aerospacial' dated 2002.



Lieutenant Colonel Manuel de La Chica Camúñez

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

Space and Cyber Power

Relevance to Contemporary Operations

By Lieutenant Colonel Tom 'Solo' Single, USA AF,
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Millennia of warfare experiences have shaped our modern day understanding of the principles of war.¹ The principles of mass, manoeuvre, offence and surprise are foundational to all operations. Within the last hundred years, the advent of the airplane has changed warfare significantly. Prior to that, warfare was only conducted on land and at sea. Air Power quickly developed as an asymmetric capability. If you controlled the air, a nation gained significant advantage. The ability to quickly concentrate overwhelming firepower and support, to adjust to changing missions and have freedom to fly over enemy forces proved that gaining control of the air was critical to winning wars. These tenets make Air Power unique from the surface domains and are a key component of successful Joint operations². These principles and tenets can also be applied to space and cyber operations. Space (considered by most to be associated with Air Power) and particularly Cyber Power are increasingly important in modern military operations.

In the last 50 years, space capabilities have become the asymmetric advantage. Satellites have freedom of manoeuvre and fly over any (and all) nations – even in peacetime. Among other capabilities, space systems provide missile warning, global weather, global communications, global navigation and timing, and global ISR. Additionally, since the early 1990s, we have been striving to provide tactical level space effects directly to the warfighter. Space capabilities have changed the way we conduct war. Where it once took hundreds of planes to engage a target, we can now destroy multiple targets from a single aircraft, using GPS aided munitions. Space capabilities allow warfighters to “see with clarity, communicate with certainty, navigate with accuracy, strike with precision, and to operate with assurance.”³



The last decade saw the emergence of cyber as an asymmetric advantage. Realising the order of magnitude improvements achievable by connecting our sensor, information and decision making systems, much effort was made to integrate those systems. Once these systems were connected, it allowed land, sea, air and space systems to be much more effectively exploited and synchronised, and this new information age is changing the way operations are conducted. Land, Sea, Air, and Space Power are able to generate effects on each of the other domains, but nothing generates effects in all domains so absolutely and simultaneously as Cyber Power. Given the cyber dependencies of the military, economy, diplomats, media, commerce and society in a growing number of countries, and given that cyberspace critically enables Land, Sea, Air, and Space Power, Cyber Power is ubiquitous.⁴

Space and cyber capabilities are vital enablers of expeditionary operations, allowing small, highly mobile ground units to operate from remote locations while being supported by Remotely Piloted Aircraft (RPA) using satellite communications and GPS. Space and cyber services are critical for both conventional and non-conventional warfare.

Unique Nature of Space and Cyber

Space and cyber are unique from land, air and sea for several reasons. First, they are inherently dual use, meaning they are used by both civilians and military users. The same systems and services that allow precision

weapons and targeting can also be used for environmental monitoring, precise farming, package tracking and a multitude of other civil applications. Increasingly, many of the systems are built and operated by civil and commercial entities, not defence forces. In fact, the commercial sector is far outpacing the development of new military space and cyber services. In addition, Space and Cyber Power are inherently a strategic (and global) capability and not limited to a single geographic area of operations. Considering the capabilities they bring to the fight, space can be considered a critical Joint enabler, supporting air, land and sea operations. Foundational to national and military power are cyber capabilities.

Relevant to Contemporary Operations?

Air, Space and Cyber Power are relevant to contemporary operations in Afghanistan and the future. At its core, Counter Insurgency (COIN) is a struggle for the population's support. The primary objective of any COIN operation is to foster development of effective governance by a legitimate government. Counterinsurgents achieve this objective by the balanced application of both military and non-military means.⁵ This implies that political and diplomatic leaders must actively participate throughout the conduct (planning, preparation, execution, and assessment) of COIN operations. The political and military aspects of counterinsurgencies are so bound together as to be inseparable.⁶ The protection, welfare, and support of the people are vital to success. Achieving these aims requires synchronising the efforts of many non-military and host nation agencies using a comprehensive approach.⁷

A comprehensive approach integrates the cooperative efforts of the departments and agencies of the government, intergovernmental and nongovernmental organisations, multinational partners, and private sector entities to achieve unity of effort toward a shared goal. A comprehensive approach is founded in the cooperative spirit of unity of effort.⁸ Space and Cyber Power are an inherent part of any comprehensive approach as each aspect of national power utilises space and cyber services. Space and Cyber Power can, and do, help to build a legitimate government, based on Rule of Law, and are helping to build the capacity of

the economy and defence capability of Afghanistan. One example is the use of unclassified commercial satellite imagery to help predict seasonal flood areas, to help with agricultural and natural resource planning, civil engineering and other applications. While the literacy rate and access to the internet is still among the lowest in the world, many Afghans have cellular phones and information technology is slowly being developed. Furthermore, cyber operations have targeted terrorist information and finance activities. Space and Cyber Power are key enablers to a comprehensive approach, whereas a fighter aircraft or main battle tank have military only applications. Whether nuclear, conventional nation-state war, or COIN operations, space and cyber are critical to modern operations.

Intelligence and Information Drives Operations

In fact, space and cyber operations may become more important than traditional air missions such as close air support, theatre airlift or other missions (perhaps not airborne ISR). Because of the dispersed nature of COIN operations, counterinsurgents' own actions are a key generator of intelligence. A cycle develops where operations produce intelligence that drives subsequent operations. These factors, along with the need to generate a favourable Operations (Ops) tempo, drive the requirement to produce and disseminate intelligence at the lowest tactical level.⁹ Space and cyber capabilities contribute to the overall ISR capability available to the Commander, to include providing near real-time indicators and carrying information from air, land and sea systems.

Information and expectations are related, and skilful counterinsurgents manage both. To limit discontent and build support the host nation government, and any counterinsurgents assisting it, must create and maintain a realistic set of expectations among the populace, friendly military forces, and the international community. Information Operations, to include psychological operations, public affairs and civil-military operations are key tools to influence and shape activities.¹⁰ Arguably, the decisive battle in COIN operations is to win the peoples' 'hearts and minds'. Every action,



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Principles of War	Tenets of Air Power	Space & Cyber Enable Joint Operations
Unity of Command	Centralised Control & Decentralised Execution	See with Clarity
Objective	Flexibility & Versatility	Communicate with Certainty
Offensive	Synergistic Effects	Navigate with Accuracy
Mass	Persistence	Strike with Precision
Manoeuvre	Concentration	Operate with Assurance
Economy of Force	Priority	Acquire with Agility
Security	Balance	
Surprise		
Simplicity		

including uses of force, must be part of a strategic communication effort because they influence the perceptions of the people and how they will support friendly forces.¹¹ In today's connected world, gaining the upper hand is often associated with the ability to relay information first. Therefore, satellite communications and access to world-wide media (including the Internet), can become a strategic and asymmetric advantage.

These requirements place a premium on capabilities such as long-dwell precision fire support assets, robust communications networks, ISR capabilities (including RPA) as well as the personnel to process, exploit, and disseminate information down to the tactical level. In order for troops to operate for prolonged periods in austere environments, greater force protection, logistics, and intra-theatre lift are needed.¹² Air, Space and Cyber Power are certainly required.

The long-term goal is to leave a government able to stand by itself. In the end, the host nation has to win on its own. Achieving this requires development of local leaders and institutions. Space and cyber capabilities contribute to improving stability and security.

They can be used to help secure borders, make elections more transparent and build infrastructure and enable communication and connection to remote areas. To enable information exchange, fibre optic and copper cable won't be laid in many austere nations; they will connect directly to commercial telecommunications satellites.

Challenge: Mission Assurance

While space and cyber capabilities are transforming modern warfare and society, they also are creating dependencies, vulnerabilities, and subsequently, significant impact of loss implications. Unfortunately, both space and cyber systems have developed in a 'sanctuary' and not in a contested environment. Consequently, mission assurance, survivability, robustness and protection were not inherently designed into the systems. Due to the unique nature of Space and Cyber Power, time and distance become essentially irrelevant because space and cyber attacks can be conducted across global distances in milliseconds. Such attacks can also spread quickly among networks, making it extremely difficult to attribute their source and to take

retaliatory action.¹³ We must prepare for a potential catastrophic failure of communications systems in the event of a space segment loss or more likely, a cyber attack. Assuring and protecting space and cyber services is now crucial to assuring Land, Sea and Air Power.¹⁴

Adversaries in cyberspace are exploiting low entry costs, widely available resources, and minimal required technological investment to inflict serious harm, resulting in an increasingly complex and distributed environment. The expanded availability of commercial off-the-shelf technology provides adversaries with increasingly flexible and affordable technology to adapt to military purposes. Low barriers to entry significantly decrease the traditional capability gap between information societies and their adversaries. Nations, non-government organisations and even some terrorist organisations are fielding sophisticated cyberspace systems and experimenting with advanced warfighting concepts.¹⁵

We must develop technologies to enable operations in contested space and cyber domains and to assure critical military missions in land, sea, air, and space against threats from cyberspace. This requires persistent situational awareness in all domains, mission and information assurance, and threat avoidance through deterrence and technology.¹⁶

Imperatives for Success

The only constant is change. Who would have predicted the proliferation and dependence on RPAs for COIN operations? Nearly every soldier has access to

space and world-wide situational awareness through the iPhone in his pocket. We must continue to change and adapt to new challenges, technology and paradigms. Air, Space and Cyber Power will continue to be vital in the future, but there will be unforeseen developments. Imperative for success is training personnel to integrate and bring to bear all coalition capabilities, to synchronise air, surface, space and cyber ISR assets, connect and distribute information from decision makers to soldiers in the field and have the foresight to push the envelope and acquire new technology faster and more efficiently. NATO has been cautious in discussing space and cyber security issues. Continuing down this road may have greater implications than the Nations dare contemplate.

“Change is the law of life. And those who look only to the past or present are certain to miss the future.”

President John F. Kennedy ●

1. Air Force Doctrine Document (AFDD) 1 'Air Force Basic Doctrine,' November 2003, page 20.
2. AFDD 1, page 27.
3. General C. Robert Kehler, AFSPC Press Release 22.2.10.
<http://www.afspc.af.mil/news/story.asp?id=123191553>
4. John B. Sheldon, 'Deciphering Cyberpower, Strategic Purpose in Peace and War,' Strategic Studies Quarterly, AU Press, Summer 2011, pg 99.
5. US Army Field Manual (FM) 3-24 Insurgency and Counterinsurgency 15 December; para 1-113 pg 1-21.
6. FM 3-24 para 1-123, pg 1-22.
7. Ibid. para 1-159, pg 1-28.
8. US Army FM 3-07 'Stability Operations,' October 2008, page 1-5 & 6.
9. FM 3-24 para 1-127, pg 1-23.
10. Ibid. para 1-147, pg 1-26.
11. Ibid. para 1-153, pg 1-27.
12. 'Air, Space and Cyberspace Power in the 21st Century,' Final Report of the 38th IFPA-Fletcher Conference on National Security Strategy and Policy, January 2010, page 58.
13. Ibid. page 13.
14. Ibid. page xii.
15. AFDD 3-12 Cyberspace Operations, pg 3-4.
16. 'Air, Space and Cyberspace Power in the 21st Century,' page 63.

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Regional Fighter Partnership

Sovereignty and Implementation Considerations

By JAPCC Regional Fighter Partnership Project Team

“The [financial] crisis makes cooperation between nations no longer a choice. It is a necessity. Today, no European Ally on its own is able to develop the full range of responses to meet all security challenges ... I see three ways ahead: pooling and sharing resources; setting the right priorities; and forging closer links with industry and within Europe.”
NATO Secretary General Anders Fogh Rasmussen, 7 Feb 2011

Some new NATO member nations in Central and Eastern Europe will struggle in the future to maintain fighter fleets capable of performing Air Policing or other desired missions. Moreover, national sovereignty and the pride in one's Air Force to remain relevant in the 21st Century create strong desires to recapitalise aging Soviet era fleets whilst producing a generation of professional airmen trained to NATO standards.

Considering the reality of scarce funding, national authorities have to cooperate more in today's environment to procure new fighter aircraft capabilities along with properly trained crews and sustainment activities. Going about this alone, through a traditional procurement arrangement increases the risk of a 'paper force', more often grounded due to high sustainment costs, lack of trained personnel, and a reduced number of aircraft on the ramp. A Regional Fighter Partnership (RFP) is an option to share costs across common fighter aircraft capabilities and their enabling aspects, including logistics, maintenance and training, whilst keeping sovereign command over these assets.

With regards to the NATO Secretary General's quote above, NATO plays an important role in forging closer links through partnerships. The new NATO Strategic Concept states; “These partnerships make a concrete and valued contribution to the success of NATO's

fundamental tasks.”¹ Below are a few considerations regarding sovereignty and other implementation issues for pursuing such partnerships.

Sovereignty

More so than with Airlift assets such as the C-17 Strategic Airlift Capability (SAC) consortium in Hungary, maintaining national sovereignty over Fighter assets places several constraints on forming a partnership. Nations must get a vote when it's time to employ fighters. They must decide when and where assets are deployed and must have an autonomous capability to operate at national bases. In order to maintain national Operational Command (OPCOM) of assets, procedures would be in place to allow nations the ability to opt-in or opt-out of specific operations. This could be achieved by chopping assets through an official Transfer of Authority (TOA) (i.e. giving Operational Control (OPCON) over specific assets) to a notional RFP HQ staff for those missions, operations and/or exercises the partner nations decide to undertake. Having a modular, opt-out option allows for flexibility at the national level, for reasons of sovereignty, and to operate autonomously at national fighter bases.

But, nations can leverage the sustainment capabilities of a partnership when needed to create a more effective and cost-effective capability. National caveats to operations must be integral to this process; accept that they do exist and deal with them similar to the way the European Participating Air Forces (EPAF) deals with these issues when they deploy as a multinational unit.²

The EPAF has shown that contingency operations are possible as a partnership. For example, the EPAF integrates with existing Air Component Command and Control for ROE and tasking flow, and national contributions remain under full command of the respective country. Nations then provide a TOA for OPCON to the appropriate international commander based on their national procedures which will include any national caveats to the ROE or specific operation/exercise.

A future fighter partnership can benefit from the lessons learned of the EPAF, which is still the closest thing to a fighter aircraft partnership in Europe today.

National Fighter Bases with Multinational HQ Staff

Whilst 3–4 nations could form a RFP with external help, these nations will still have fighter bases that are capable of autonomous operations, and national staffs will still manage the day-to-day OPCOM of their respective air forces. But, having a permanent multinational HQ Staff is essential to realise the benefits of day-to-day interactions within a fighter partnership. This means that nations would have to staff this HQ, but, it would also require collaborating nations, which are non-partnership nations, to offer assistance with expertise, mentors and instructors.

Some duplication of fighter capabilities would be inevitable, however the partnership would realise savings by creating and jointly manning the central multinational HQ Staff to manage and consolidate common enabling aspects, including logistics, maintenance and training. Common standards, policies, and procedures (Rules & Regulations, Doctrine & Concepts), based on existing NATO documents, could be jointly developed and implemented together, creating a truly interoperable and integrated partnership. The RFP HQ Staff would act as the central point of contact for partnership interoperability and standardisation matters and to issue directives and/or recommendations ensuring the highest level of standardisation. Naturally, NATO and member nations would need to support this effort with resident expertise.

The HQ staff could be broken into Operations and Logistics Divisions, and even a combined Regional Fighter Training Centre. This training centre could be modelled on the Tri-National Tornado Training Establishment, a multinational air unit based at RAF Cottesmore in Rutland, England from 1981 to 1999³ which successfully cross-pollinated standards, tactics, techniques and procedures in the Tornado aircraft. Additionally, a central Regional Fighter Depot Centre could be stood up, either utilising an existing depot facility or as a new facility for depot level maintenance. But it is the governance of the multinational HQ Staff that makes this concept different from other multinational programs.

Governance

The RFP is envisioned as an Memorandum of Understanding (MOU) organisation with governance mechanisms, such as a Steering Board, that require nations to work with each other and compromise to find common legal and operating ground. Recent partnership experience has created lessons learned that this partnership could exploit. The RFP MOU, for example, could be based on a combination of the EPAF and C-17 SAC MOUs, but with greater detail with respect to collaborative training, logistics/maintenance operations, and employment/operating procedures.

As mentioned, there would be a real need for non-partnership nations to collaborate with the new RFP, bringing in established experience and mentorship to aid the member nations transition from Soviet era equipment to modern systems. Ultimately this concept must seek to strike a balance between national flexibility and partnership conformity.

Sharing

Nations would save costs by a reduced footprint, both during peacetime and during deployment, through shared facilities, maintenance (when allowed), support equipment and personnel. Nations do not have to share everything, but where there is common ground, there is an incentive to find efficiencies and save money. For example, during the 2009 BOLD AVENGER exercise, the EPAF consisted of 21 F-16s and 238 personnel drawn from 11 NATO member nations. The detachment shared mission support equipment and “any of our F-16s can be put in a Dutch mobile shelter, pulled by a Norwegian tractor and served with Danish equipment, whilst the Portuguese secure the jet.”⁴ Each nation reduced their deployed maintenance personnel by over 20% with shared beddown responsibilities.

Nations have differences in weapons and logistics which limit the scope of sharing (for example Crew Chiefs and armament procedures) but other areas could be shared by 4-man elements, where 2 are qualified from the country's jet and two are shared. Other considerations have to be enforced such as

maintenance inspections and exceptional release of the aircraft to fly due to the responsibility of the respective nation to ensure there remains a key link to national airworthiness standards.⁵

Certifications, directives and restrictions which are agreed to as a partnership can constrain and require conformity within national procedures. For example, nationally divergent aviation laws which apply to the certification of military personnel, equipment and aircraft parts, makes sharing of maintenance (personnel and tools), aircraft spares and the aircraft themselves a problematic issue. The partnership helps to find commonality in these areas due to the incentive to save costs.

“... the partnership would realise savings by creating and jointly manning the central multinational HQ Staff to manage and consolidate common enabling aspects, ...”

Once issues are resolved, maintenance and sustainment of a fleet of aircraft by a multinational organisation should prove more efficient and show multiple cost and scheduling benefits across the participating nations. Standardised training, certification, and even basic understanding and applications of a common language could result in optimisation of limited resources and a major improvement to multinational logistics operations. Commonality is the key to success.

Commonality

Implementation considerations must begin with a common airframe, basic maintenance and logistic support, pilot training and course development, identifying just a few examples. Without naming specific aircraft, nations would need to agree on a common baseline with basic capabilities. The fighter should be multirole in air-to-air and air-to-ground missions for air policing, air defence, precision strike and close air support. Maintenance and logistics support is an area where significant cost savings could be achieved if the partnership takes the right options and tackles

some recurring issues. "The best way to achieve economy of effort is to integrate logistics efforts as closely as possible to avoid costly redundancies in logistics forces, infrastructures, distribution networks, and supplies."⁶ NATO has experience in this field.

NATO Logistics Support

The NATO Maintenance and Supply Agency (NAMSA) could be asked to negotiate contracts. A possible NAMSA engagement could be in the form of a NAMSA Weapon System Partnership (WSP); this constitutes a legal framework for participating nations and provides the vehicle to task NAMSA with any logistic tasking.⁷ The biggest challenge of a WSP is that the acquisition of a major aircraft weapons system is currently beyond the scope of NAMSA.

There could be ways around this, however, and the current NATO push to streamline 14 NATO agencies into 3⁸ could represent a unique opportunity to merge NAMSA's current 'in-service' support role with an 'acquisition' role. Specifically, two possible solutions could be: (1) lobby NATO and NAMSA to increase NAMSA's portfolio to include aircraft acquisition, thus merging acquisition with in-service support functions, or (2) create a program management office as a sub-element of the WSP, whose responsibility would be to cooperatively manage member nation's bi-lateral aircraft acquisitions. Further study and multi-lateral discussion would be required to truly assess these options and define a way ahead.

Conclusion

The implementation considerations discussed here are only a few of the more important issues that must be addressed from the beginning of any partnership. The main challenges to the RFP concept include: maintaining cooperation and trust; decision making and compromises; creating interdependence on others; national caveats; individual nation's differing standards, proficiencies, certifications and skill sets; and national liability and legal concerns. We believe, however, in the end the advantages of regional cooperation outweigh the challenges associated with it. With the right political will, cooperation, and active participation, the RFP concept could provide a cost effective regional solution that is needed if newer NATO nations wish to recapitalise Soviet era hardware and re-establish a modern, indigenous air policing / air defense capability. The partnership would allow smaller nations to have greater regional influence while at the same time create a stronger, more effective and capable fighter aircraft capability for NATO. The RFP concept is intended to be used as a platform for discussions focused on what is within the realm of the possible, given today's fiscally constrained environment. ●

1. North Atlantic Treaty Organisation, NATO PO(2010)0169, 19 Nov 2010, para. 28 (avail: <http://www.nato.int/lisbon2010/strategic-concept-2010-eng.pdf>).

2. The EPAF formed the EPAF Expeditionary Air Wing (EEAW) in 2002 between five nations.

3. Parsons, 1999.

4. Fulber, 2009; Commander Van Eeckhoudt, Belgium Detachment Commander stated after the exercise.

5. Ibid.

6. Gorman, Multinational Logistics: Managing Diversity, 2000.

7. NAMSA – NATO Maintenance and Supply Agency, 2011: http://www.namsa.nato.int/customers/customer_sup_e.htm

8. This does not include the NATO Standardisation Agency which will remain a separate entity.

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F-16A, F-15C and F-15E flying during Desert Storm.

The Missing Link

Tying Tactical Air Operations to Policy Goals

By Colonel Michael W. Kometer, USA AF, SAASS and Dr. Stephen E. 'Wilbur' Wright, SAASS

Introduction

When the present crisis in Libya erupted in February of this year, the debate in the media quickly turned to discussions of a no-fly zone. Led by US Senators McCain and Lieberman, high-level officials began to shape the tactical options before the U.S. had even decided to intervene. US Secretary of Defence Gates' cautionary advice was seen as an obstacle to political progress.¹ Military analysts cautioned against entering a limited conflict only to slide down a slope to heavier military involvement. Sure enough, months later, the debate about the goals of the conflict continues and military involvement has long since surpassed the tactical employment of a no-fly zone.

There must be a better way to engage in a strategy debate. Military planners need to be able to plan their actions towards achievable end states, assisting decision-makers by linking policy goals to tactical action. Unfortunately, events can overcome this linkage pro-

cess, challenging military strategists and planners to provide leaders with acceptable options. Where the recommended military strategy does not give decision-makers the options they want, the resultant process may frustrate military planners. This article will show how this exchange occurred in US Operations DESERT STORM (ODS) and ALLIED FORCE (OAF) and discuss how the 'design' movement offers air strategists a way to balance policy objectives with military action.

End States or Options?

The military teaches its planners to focus tactical actions toward the achievement of end states. Tactical actions accomplish tasks that create operational and sometimes theatre effects that eventually contribute to achievement of the policy end state(s) that terminate a conflict. In a process called strategy-to-task, military planners learn to start with these end states and back out the objectives and tasks that will lead to their achievement. All they need from strategic level decision-makers is a clear end state.

But this puts the strategic level decision-maker in a position where he or she has to bring clarity to an often nebulous situation – when lack of clarity is often advantageous. The environment they have to assess has been characterised as volatile, uncertain, complex, and ambiguous.² The problems are not self-evident, and military action is not always the best response. Strategic level decision-makers try to coordinate a response across all departments of a government; but when it is unleashed, military action is a blunt instrument that often alters the entire international/regional arena – not just the conflict in question. Besides, military victory is not necessarily the end of a conflict. Conflict is a relative constant in the international environment, leading one expert to propose the goal of strategy is continuing advantage – not an end state at all.³

Strategic level decision-makers seldom have answers. They want options.

The Benefits of Clear Goals

Where the military strategy gives them these options, the military may be able to craft and implement its preferred strategy using the strategy-to-task process. When Iraq invaded Kuwait in August of 1990, the US military had plans to defend Saudi Arabia – but not to expel Iraq from Kuwait. Then President Bush clarified US policy goals to include ejecting Iraqi forces from Kuwait.⁴ In need of aggressive options, Gen Norman Schwarzkopf called the Air Staff, and Col John Warden got busy translating his air campaign ideas from the Soviet Union to Iraq.⁵ Although his plan to win the war through air power alone was too ambitious for Schwarzkopf, Instant Thunder became a basis for the campaign plan.

With clear goals and an innovative foundation, air planners were able to translate the strategy into air operations in a straightforward manner. In on the development of Operation INSTANT THUNDER (OIT), then Lt Col David Deptula completely understood the concept behind it. Warden's Five Rings theory allowed the planners to search for targets that would affect centres of gravity in each ring.⁶ Then they developed the Air Tasking Order to produce the desired effects with the available weapon systems. Deptula said it

was a "planner's dream."⁷ For the most part, the guidance for his actions was mission effectiveness; linking effects to objectives – clear objectives from decision-makers to tactical employers. Once this strategy to task chain began, it continued through to mission completion with very few interruptions.⁸

The Necessity of Political Sensitivity

But where disconnects exist between policy goals and military strategy, the military may be left adjusting to shifting guidance from the political level. When Lt Gen Michael Short became the Combined Forces Air Component Commander for OAF in 1999, he had an 'air strategy' in mind. He wanted to avoid the incremental use of Air Power of the Vietnam War for the overwhelming Air Power possessed by the US. In his mind, professional Airmen had learned "You go after the head of the snake, put a dagger in the heart of the adversary, and you bring to bear all the force that you have at your command."⁹ But his plans for hitting the "strategic target set in Belgrade" stayed in US only channels, and NATO planners came up with an entirely different plan that executed in phases, keeping Belgrade off limits.¹⁰

Short's proposed strategy was not in line with the desired political options. True, strategic-level decision-makers chose a less aggressive strategy because they thought that Serbian President Slobodan Milosevic would give up after minimal bombing.¹¹ But more importantly, NATO did not have the political will-power to hit Serbia hard at the beginning of the conflict. That course of action was outside the political room to manoeuvre.¹²

So OAF escalated through the NATO plan's phases, frustrating Short's planners. Instead of following strategy-to-task methodology and effects-based planning, the planners responded to a highly politicised strategic-level target approval process and daily video teleconferences with Gen Wesley Clark, Supreme Allied Commander Europe (SACEUR). When Milosevic did not capitulate but instead increased his ethnic cleansing after the initial bombing, Clark directed Short to put as much effort as possible on the Serb Army in Southern Kosovo – despite Short's protests

that this would be ineffective. Short was eventually able to accomplish some interdiction in parallel with these efforts, and as the conflict dragged on the bombing grew more intense and moved closer to Belgrade.¹³

As it turned out, the graduated approach, less a designed strategy than a result of hedging, eventually compelled Milosevic to capitulate. Milosevic's gamble that NATO would disintegrate backfired. The tactically ineffective attacks in Kosovo had the strategic effect of giving NATO the moral high ground; the bombing produced low collateral damage while the Serbs shot down only two aircraft and inflicted no NATO casualties; and bombing started to produce economic hardship and discontent in Serbia. Finally, Russian support for Milosevic began to wane.¹⁴

It is possible a more aggressive military strategy could have been so devastating as to force Milosevic to back down quickly. However, the fact is, NATO decision-makers wanted to avoid an aggressive stance, desiring options that gave priority to Alliance preservation. Then they needed to respond when Milosevic stepped up his ethnic cleansing. Finally, they needed to exploit evolving military and diplomatic success to bring him back to the negotiating table. Air power provided tools for all these options, but as a resultant, rather than as a designed strategy. In contrast to the ODS case, the preferred air strategy was not developed and sold at the strategic level, and did not give decision-makers the options they needed.

The Need to Strike a Balance

Political decision-makers relish options – freedom of action – and air power often gives them this flexibility. The Berlin Airlift allowed the West to respond to Soviet aggression without resorting to escalation of violence. Operations NORTHERN WATCH (ONW) and SOUTHERN WATCH (OSW), while distasteful to the US Air Force, allowed a coalition to put pressure on Saddam Hussein for twelve years without a costly war that might have upset a delicate regional balance.

The downside of the flexibility that comes from a menu of options, short of all-out war, is it may make

action alternatives too easy. When political decision-makers can apply military action in an experimental fashion, they risk consequences that snow ball out of control. There is merit to thinking it through to the end.

The military strategy needs to balance sensitivity to the political situation with a theory of action that allows planners to align tactical actions to policy goals from start to finish. In OAF, Air Power displayed the sensitivity, but dangerously approached experimentation. In ODS, OIT included a theory of action that linked tactical actions to victory, but neither friend nor foe challenged its ability to flex with the political situation.¹⁵

Design as a Potential Answer

The current answer to this dilemma is the movement toward using 'design'. The traditional approach looks for a strategic end state set in stone, plans to accomplish it, and measures progress towards it. Instead, the design movement argues we should frame context and problem using systems methods that recognise the complexity inherent in both. Framing, of context and problem, leads to an operational approach that tailors action to strategic goals within complex environments. The challenging part is monitoring the environment to see whether the problem frame needs to be adjusted – a decision called 're-framing' that would require adjusting operations, or even the policy objective itself.¹⁶

Adjusting operations after re-framing requires incredible flexibility – flexibility that manpower-intensive land operations often lack. During OAF, the air component essentially sequenced through three different operational approaches in the 78-day operation – each time with little notice. In this politically sensitive mission, strategists matched operational and tactical action to changes in political conditions to achieve strategic goals.

Conclusion

The quest to link air operations to policy goals has pitted military planners' desires for definable end states against political decision-makers' desires to avoid the

fallout of military action. ODS and OAF showed opposite poles of this tension. Design is meant to strike the balance between these poles.

While not a 100% solution for the Libya situation, design could have facilitated a better discussion of the options, leading to a well thought-out strategy. A design-led analysis of environment and problem would have identified the situational complexities of a US policy regarding desires for democratic governance, strong partners for the fight against extremists, and support of popular uprisings against oppression. Seen in such a context, decision-makers could recognise the 'problem' as not one of no-fly zone implementation, but of regional power transition.¹⁷

This assessment of the environment and problem could have shown all involved that it might indeed be wise to start with a limited stance like a no-fly zone and sanctions to pressure the Gaddafi regime. However, this would have to be coordinated with limited aims, such as obtaining concessions that gave the people a say in certain government matters, rather than regime change. Then, if Gaddafi had still been defiant and the populist movement had become more organised, decision-makers could have expanded the aims.

Military leaders, strategists, and planners need to continue to engage in the debate over strategy, linking action to outcomes. However, strategic-level decision makers need options, and that is Air Power's strength. We should strive to supply them. ●

1. Delargy, Christine. "McCain calls for no-fly zone over Libya, criticises Obama's handling of situation." CBS News.com [cited 1 June 2011]. Available from http://www.cbsnews.com/8301-503544_162-20038372-503544.html; INTERNET.
2. Yarger, Harry. *Strategy and the National Security Professional: Strategic Thinking and Strategy Formulation in the 21st Century*. Westport, Connecticut: Praeger, 2008, 28.
3. Dolman, Everett. *Pure Strategy: Power and Principle in the Space and Information Age*. New York: Frank Cass, 2005, 12.
4. Friedman, Thomas. "The Iraqi Invasion: Bush, Hinting Force, Declares Iraqi Assault 'Will Not Stand'; Proxy in Kuwait Issues Threat". The New York Times, 6 August 1990. Available from <http://www.nytimes.com/1990/08/06/world/iraqi-invasion-bush-hinting-force-declares-iraqi-assault-will-not-stand-proxy.html>; INTERNET.
5. Olsen, John Andreas. *John Warden and the Renaissance of American Air Power*. Washington, D.C.: Potomac Books, Inc., 2007, 146.
6. Deptula, Gen David, USAF (ret). 'Reflections on Desert Storm: The Air Campaign Planning Process.' Briefing version 8, 20 October 1998. Provided to author by General Deptula.
7. Ibid.
8. Of course, there are noted exceptions, like Secretary of Defense Richard Cheney's insistence on adding effort to the Scud Hunt and the restrictions on bombing Baghdad after the al Firdos bunker incident.
9. Public Broadcasting System interview with Lt Gen Michael Short, USAF (ret) [cited 31 May 2011]. Available from <http://www.pbs.org/wgbh/pages/frontline/shows/kosovo/interviews/short.html>; INTERNET.
10. Ibid.
11. Henriksen, Dag. *NATO's Gamble: Combining Diplomacy and Airpower in the Kosovo Crisis 1998–1999*. Annapolis, Maryland: Naval Institute Press, 2007, 109–110, 178.
12. Ibid., 193.
13. Kometer, Michael. *Command in Air War: Centralized Versus Decentralized Control of Combat Airpower*. Maxwell AFB, AL: Air University Press, 2007, 127–128 and Benjamin S. Lambeth. *The Transformation of American Air Power* Ithaca, New York: Cornell University Press, 2000, 184–187.
14. Hosmer, Stephen. *The Conflict over Kosovo: Why Milosevic Decided to Settle When He Did*. Santa Monica, CA: RAND, 2001, 3.
15. For a good explanation of theory of action, see Maykish, Paul. 'Ways Independent of Means: Toward Making Strategy More Creative'. Master's thesis, Air University, 2011.
16. School of Advanced Military Studies. *Art of Design, Version 2.0*. Fort Leavenworth, 2010, 134.
17. This analysis does not link to actual US policy. It merely suggests hypothetical policy to demonstrate the fact that the current process skipped policy development and jumped into military strategy.



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A JAPCC Policy Proposal

NATO Employment & Coordination of Space Capabilities

By Major Phil Verroco, USA AF, JAPCC

Introduction

Space is a unique operational domain like Air, Land and Sea in which and from which national capabilities important for Alliance defence and security are derived. Space capabilities enable and enhance all NATO missions including the unparalleled ability to deploy and sustain robust military forces in the field and the ability to contribute to stabilisation and reconstruction. The current use of Space capabilities, the rapidly evolving strategic security environment, and the complexity of the Space domain, highlight the requirement for a NATO Space policy.

Proposed Guiding Principles

- Alliance collective defence and security is applicable to Space capabilities supporting NATO operations
- International standards and norms contribute to the preservation of Space capabilities for all
- The coordination of Nationally owned and controlled space capabilities will result in improved operational effectiveness and efficiency for the Alliance and nations
- Space capabilities, along with technology in general, are rapidly improving resulting in the levelling of previously stark disparities

- Coordination and collective defence of Space capabilities employed on behalf of NATO is an active and continuously evolving process

Proposed Definition

NATO Space capabilities are orbital and non-orbital capabilities whose primary function is to deliver products and applications supporting NATO operations in the doctrinal mission areas of: Space force enhancement; Space control; Space support; and Space force application. It specifically includes:

“Space capabilities enable and enhance all NATO missions including the unparalleled ability to deploy and sustain robust military forces in the field and the ability to contribute to stabilisation and reconstruction.”

- Craft or vehicles designed to operate at altitude in the absence of any aerodynamic control for any portion of their operations profile and their related launch facilities.
- Terrestrial facilities designed and/or operated to monitor, command, control and communicate with craft or vehicles as referenced above and/or other similar terrestrial facilities.
- The electromagnetic links used to monitor, command, control and communicate with craft or vehicles as referenced above.
- The personnel trained to operate, employ, acquire, maintain and defend craft, vehicles or facilities as referenced above.
- User equipment such as tactical data processors and receivers specifically designed and/or operated to receive information from other Space capabilities.

Proposed NATO Policy Tenets

- Space capabilities help underpin international stability, well-being, security and peace as well as the individual and collective capacity of nations to provide deterrence, resist armed attack and manage crises. Therefore, NATO seeks to preserve and protect access to Space based capabilities in keeping with international norms and existing treaties.

- NATO is committed to the concept that Space is open to all nations for peaceful purposes. The Alliance will engage with the international community to prevent misunderstanding and build partnerships while improving its ability to coordinate and preserve Space capabilities for NATO operations. To that end, NATO supports the development of Space capability Transparency and Confidence Building Measures and the development and sharing of Space Situational Awareness, to include the ability to attribute Space capability activities to terrestrial actors, as a prerequisite for safe and responsible Space operations.
- National and commercially provided Space capabilities currently enable and enhance NATO operations by providing intelligence surveillance and reconnaissance; command and control, communications; meteorological data; position, navigation and timing; and ballistic missile launch early warning. NATO's first priority for these Space capabilities is thus to assure their continued delivery in support of NATO operations.
- Space capabilities are integral to Alliance activities and require general space education as well as the development, certification and management of personnel from across the nations. NATO seeks the capability to plan for the optimal employment and defence of Space capabilities as a fundamental part of Alliance planning and operations. NATO will identify billets throughout the command structure to accomplish these functions and request personnel to fill them.
- The effective use of information, including that derived from Space capabilities, is paramount to NATO operations. This principle also applies to the employment and preservation of Space capabilities supporting NATO operations. NATO will aid coordination between contributing nations in support of Alliance objectives.
- The responsibility to employ nationally provided and controlled Space capabilities and to plan for their preservation will fall across multiple disciplines and organisations within nations and the Alliance. NATO must coordinate Space capability activities supporting NATO operations in order to aid the Alliance and nations to remain effective, efficient and flexible.

- NATO will ordinarily meet Space capability requirements through national contributions augmented by commercially available services. NATO views Space capabilities as mechanisms that possess unique operational benefits which make them ideally suited to meet NATO mission requirements in certain situations. Therefore, Space related capabilities, products and applications are expressly desired as a portion of a nation's contribution to NATO. NATO encourages nations to partner together to develop Space related capabilities, products or applications that may be beyond the resources of a single nation. To enhance the process of reform, modernisation and transformation NATO will specify Space capability needs in terms of availability, persistence, assurance, tasking authority and information releasability.
- NATO supports and encourages the development of innovative Space capability technologies and initiatives that reduce cost, increase availability, improve capability, add resiliency and contribute to improving the Alliance. NATO will remain abreast of the latest developments and opportunities in order to incorporate as rapidly as possible new Space capabilities.

Why this JAPCC Proposed NATO Space Policy?

In March 2011, the JAPCC hosted an Allied Command Transformation Space Integrated Project Team (IPT). The IPT is tasked to offer proposals in the areas of Policy, Organisation, Education and Training, and Current Operations. This policy proposal was developed

... NATO supports the development of Space capability Transparency and Confidence Building Measures and the development and sharing of Space Situational Awareness, ...

in concert with and in support of that effort. As a Centre of Excellence, the JAPCC has no intention to write a NATO policy. This proposal is meant to help readers understand and *debate* the impact of realistic and achievable policy proscriptions both now and in the future.

Provocation

With those thoughts in mind, the JAPCC invites you to offer your criticism and insight. To assist in the creative process, we submit the following questions for your consideration. Feel free to answer the questions, ask your own, or provide separate dialogue by sending an email to articles@japcc.de with the subject line 'Proposed Space Policy'.

1. What would NATO gain or lose by adopting a Space policy?
2. How important is the role of national sovereignty in an Alliance Space policy?
3. What are the difficulties for the Alliance associated with adopting the proposed definition of Space capabilities?
4. Are the proposed guiding principles and tenets in-line with the NATO Strategic Concept and/or the underpinnings of the Alliance? ●

Major Phil Verroco

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



Introduction by the New JAPCC Editor

As the Journal's new Editor, I would like to thank the JAPCC's Director, General Welsh, for his Foreword to this edition. I would also take this opportunity to add my personal welcome to all readers, and urge you to engage with us in the on-going debate on all aspects of Joint Air and Space Power. Our Journal provides a forum to discuss Air and Space Power related matters, allowing stakeholders of all kinds, from NATO nations, organisations and agencies, academia and industry as well as individual Air Power practitioners, to present their views and perspectives, stimulating and challenging the Air and Space Power community and our illustrious readership. Your contributions in helping to transform Joint Air and Space Power are vital. I hope the Journal sparks your interest and that



Alessio Cecchetti, Brigadier General, ITAF
Assistant Director Capabilities

© JAPCC, Sgt1 Lilian Brandon

you feel inspired to respond to the articles in this edition as well as future editions. I also encourage you to complete our on-line questionnaire at:

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

Thank you for your continuing support. ●

JAPCC Sends Space Delegation to Prague

In July 2011, the JAPCC participated in panel discussions at the 'Space Security through the Transatlantic Partnership' conference in Prague, Czech Republic. Co-sponsored by the European Space Policy Institute (ESPI) and the Prague Security Studies Institute (PSSI), over one hundred senior space experts from government, non-governmental organisations, think-tanks, academia and industry from across Europe, North America and Japan attended the event.

The objective of the conference was to understand common and diverging viewpoints with an aim to improve space security. The JAPCC participated in the 'Transatlantic approaches to international space security cooperation' panel, joined by the principal advisor to European External Action Service for space policy, the Chief Technical Officer for the Eutelsat Corporation, and a Professor from Swansea University, UK. The

panel was moderated by the president of the George C. Marshall Institute. Other panels addressed: Defining space security for the 21st century; Transatlantic approaches to international space security cooperation; Governance of space activities; Security policy dimensions of Space Situational Awareness; and Transatlantic space crisis management for the future.

The decision to lend a delegation to these discussions reflects the dedication of the JAPCC on raising issues for consideration within the Alliance and highlights the value of establishing and maintaining relationships with organisations such as ESPI. The extremely high calibre of attendees, and their positions of influence, made the conference a superior opportunity for the JAPCC to further the Director's vision to "Be NATO's recognised champion for the advocacy and transformation of Joint Air and Space Power". ●



JAPCC Visits the Canadian Forces Air Warfare Centre

In line with the JAPCC Improvement Campaign which was established in 2010, in part to initiate and enhance mutual cooperation between the JAPCC and other Air & Space power military and civil organisations, a JAPCC delegation visited the Canadian Forces Air Warfare Centre (CFAWC) in Canada/Trenton in July 2011. The delegation was led by the Concept and Development Branch Head with the opportunity to provide a general briefing to the Chief of Air Staff-Director Force Development.

During the CFAWC visit both groups provided detailed information on their respective organisations, missions, visions and responsibilities to include exchanging Programmes of Work (POW). During the discussions some areas of common interest were identified. These include studies and projects related to future Air Power challenges and capabilities, Air-Land Integration and Counter-Piracy operations. Greater co-operation in intelligence and Lessons Learned/Identified sharing was also considered.

Both organisations are currently assessing the other's POW in more detail in order to identify additional areas of cooperation. In the meantime the establishment of the required CIS network of cooperation has already begun.



JAPCC hopes this visit will act as a catalyst to inspire other Air and Space Power civil and military organisations to establish or enhance cooperation with the sole NATO accredited Air Power Competence Centre and to use its strategic Air and Space Power related 'think tank' capabilities. ●



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A pop-up gun turret used to defend Fort Eben Emael.

JAPCC Staff Ride – Fort Eben Emael, Belgium

The JAPCC Education and Training (JET) Strategy is designed to equip newcomers to the organisation with the skills they require to operate as effective members of staff. A key element of the JET Strategy is the provision of Staff Rides, requiring newcomers to work together in undertaking initial research, identifying and accessing the resources required to conduct the Staff Ride, and in delivering clear briefings. Additional benefits of the Staff Rides include the participation of other members of the JAPCC to continue their education in military matters, and with much military history close at hand, they offer an extremely cost-effective means of providing relevant education and training.

The most recent Staff Ride took place in July 2011, when 25 newcomers and established members of the JAPCC visited Fort Eben Emael in Belgium. The visit

included a guided tour of the Fort's extensive tunnel network, support infrastructure and gun positions. Prior to the visit, participants were briefed on the historical context of the 1940 action that resulted in the defeat and occupation of the Fort. During the visit individual JAPCC members provided vignettes on a variety of historical subjects. These included the use of assault gliders during the operation, the successful employment of new technologies such as shaped charges, and the critical role played by Command and Control for defenders and the attacking force alike.

Those who took part in the Staff Ride found it informative and commented on the relevance of the visit to work currently being conducted by the JAPCC, in particular in the areas of Air-Land Integration and combining the exploitation of innovative technologies with novel tactics. ●

‘A History of Air Warfare’



By John Andreas Olsen
Potomac Books, Inc.

Reviewed by:

Maj Önder Şahan, TUR AF, JAPCC

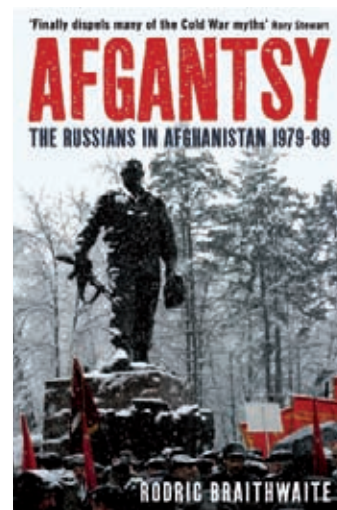
“They say history always repeats itself, but if we learn from the past would it still repeat itself?” This is what Mehmet Akif Ersoy asked during the First World War. When we look at history we often see military forces repeating the same mistakes, sometimes very soon after it occurred. Military scholars are shocked at our ability to forget lessons learned in such a short period of time.

Why do we repeat the same mistakes? Because we don’t combine our warfare history studies in depth, width and in context. Students of air warfare should read this book. It provides an overview of Air Power – specifically its effectiveness, utility, and applicability – through critical examinations of the most important campaigns in which Air Power played a significant role, from the First World War to the second Lebanon War.

The book is organised chronologically, however each chapter is written by a different writer who is a subject matter expert in his/her field. The book focuses primarily on the strategic and operational levels of war, and how the conduct of operations affects political and military outcomes. Study *A History of Air Warfare*, and you will observe it steps back from immediate experience and presents an independent view of events. ●

‘Afghantsy – The Russians in Afghanistan 1979–89’

Afghantsy – The Russians in Afghanistan 1979–89 by Rodric Braithwaite is a sympathetic account and a modern retake of the Great Game of the 19th Century, of political and military intrigue with Afghanistan at its centre. Braithwaite reflects upon the Soviet political mood at the height of the Cold war, reluctant at first to intervene in Afghanistan, to the need to defend their southern border from the perceived encroachment of the United States. The War itself is seen through the numerous accounts of the common soldier, the boredom interspersed with brutality, disease, criminality and leading finally to despair and defeat. A strong comparison is made with the American involvement in Vietnam, against a similarly determined enemy, but leaves the read-across to the current NATO-led campaign to the reader; those having recently served in Afghanistan cannot fail to recognise the similarities and that the latest attempt to help the Afghans help themselves is having little more success than the Soviets. In the end Afghanistan was abandoned to civil war from which emerged the Taliban whilst the Russian Army returned to a collapsing Soviet Union and to recrimination both internal and external. If the book has one weakness it lacks insight from the Soviet archive, which remains inaccessible. That said, *Afghantsy* is, to date, the definitive account of the Russian experience in Afghanistan and a must read for historians, the military and especially the politicians. ●



By Rodric Braithwaite
Profile Books, Great Britain, 2011

Reviewed by:

Wg Cdr Richard Wells, RAF, JAPCC



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