

ON THE COVER



Component Integration Challenges presented by Advanced Layered Defence Systems (A2/AD)

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NATO should seek to foster a training environment that permits high-intensity learning, to include “failing to induce adaptation to achieve success” as an acceptable method of learning.



Author's Note: The observations and assessments in this article apply only to NATO's exercise programme, and are not intended to indicate any assessment of past NATO operations or current operational planning. Furthermore, many of these observations have been articulated in one form or another by senior leaders across the Alliance at various speaking engagements, such as the Air and Space Power Conference, the Maritime Expeditionary Operations Conference, and in articles and speeches within the public domain. These observations, therefore, should be viewed as unclassified perspectives on the conduct of training teams during exercises.

Editor's Note: The following article is an abridged version. The original, non-abridged, article is published on JWC's Intranet NATO SECRET (NS) website portal. Additionally, a brief classified NS covering specific weapons systems and joint integration may be accessed on JAPPC's NS homepage under the A2/AD Section.

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Anti-Access/Area Denial (A2/AD) is a term that has grown in the vernacular of many NATO Nations in recent years. The concept of A2/AD is not viewed in the same manner by every nation. In fact, some see this as a new buzzword for an old problem. There are, indeed, fundamental tenets of the concept, which brings new challenges to the Alliance. Furthermore, there is not currently an accepted NATO definition of the term. Some refer to A2/AD as “that family of military capabilities

used to prevent or constrain the deployment of opposing forces into a given theatre of operations and reduce their freedom of manoeuvre once in a theatre”.¹ This article will use this verbiage as a working definition to serve as a baseline for discussion.

The key phrase in this particular definition is “family of capabilities”. It is in this area where some nations, and the respective services within those nations, start to diverge in their understanding and representation of the nature of the challenge. In many circles, the term A2/AD has a strict “air” connotation. There is, at times, a prevailing belief that this is an “air component issue”, and one “the air component needs to solve”. Furthermore, looking strictly at the military capabilities of the A2/AD system is also potentially mischaracterizing the nature of the challenge. In fact, for these two reasons, the United States Navy has ceased using the term, as explained in September 2016 by the U.S. Chief of Naval Operations, Admiral John M. Richardson: “The problem with the A2/AD term is that it conflates strategy with tactics in a way that neglects the non-military aspects of anti-access warfare, minimizes the role of deterrence, and focuses us like a laser

beam on tactical analyses on how particular opposing weapons systems will perform.”²

Furthermore, many opine that A2/AD is not a new concept, only today's manifestation of the struggle between offensive and defensive capabilities and technological advancement. However, what is new today are the ranges at which these systems operate in air, land and above/on/below the sea. We are now entrenched in a situation where blue and red forces will operate well inside each other's area of influence, in an overlapping bubble of power projection.

This article will discuss the impact of A2/AD as it relates to the Alliance and review how NATO's current exercise programme is challenged with finding the best approach to understanding and addressing this complex problem. Rather than the “buzzword” A2/AD, the term

OPPOSITE: Celebration of the 72th anniversary of the Victory Day, Russia, 9 May 2017. Picture shows 9K720 Iskander (NATO reporting name SS-26 Stone), a mobile short-range ballistic missile system. Photo by Free Wind 2014, Shutterstock. HNLMS BRUINVIS during a NATO submarine rescue exercise, DYNAMIC MONARCH. Photo by WO Artigues (MARCOM). A close-up of a short-range ballistic missile system, photo by Denis Kabelev, Shutterstock. **ABOVE:** A stamp recently printed in Russia, Olga Popova, Shutterstock.



ADVANCED LAYERED DEFENCE SYSTEMS



ABOVE: Proliferation of ballistic missiles, such as SS-26 Iskander (pictured on the right), poses an increasing threat to Allied populations, territory and deployed forces. Many countries have, or are, trying to develop or acquire ballistic missiles. The proliferation of these capabilities does not necessarily mean there is an immediate intent to attack NATO, but it does mean that the Alliance has a responsibility to take this into account as part of its core task of Collective Defence. NATO graphic illustration (www.nato.int/cps/en/natohq/photos_112331.htm)

“Advanced Layered Defence Systems” will be used in an effort to further articulate the joint nature of the problem facing the Nations, as well as Allied Command Operations and the subordinate components from the Joint Force Command level down to the tactical units.

As expressed at the Wales and Warsaw NATO Summits, there is a growing realization across the Alliance that the changing global security environment is bringing new challenges to the Alliance. The resurgence of a Russia that is seeking more presence on the global stage has manifested across the entire Alliance, from the High North into the Atlantic Ocean, in the Mediterranean Sea and in the Baltics. Russia has spent a significant amount of time, money and effort to modernize her capabilities, and focus that effort to counter NATO’s strengths. The installation of modern Advanced Layered Defence Systems in critical areas is being accomplished with the goal to impede NATO’s freedom of manoeuvre in the Eastern Mediterranean and the Baltic Seas. Therefore, it is incumbent upon NATO’s exercise and training programme to prepare accordingly. There are elements of the advanced layered defence challenge, which can be exploited through proper,

joint analysis of the problem set. NATO currently retains a technical advantage but cannot cede the advantage to a potential adversary by discounting adversary capabilities and assuming Alliance victory just by showing up.

What is the JAPCC, and why is A2/AD discussed in the JWC’s The Three Swords?

The Joint Air Power Competence Centre (JAPCC) was the first organization to be certified under NATO’s Centre of Excellence (CoE) concept (2005) and is the CoE dealing with the entire spectrum of Air and Space Power challenges for the Alliance. The JAPCC is comprised of 16 Member Nations that collaborate and address challenges to the Alliance in the domain of Air and Space in a joint manner. General Tod Wolters serves as the JAPCC Director in addition to his other roles as Commander Allied Air Command as well as Commander of U.S. Air Forces in Europe and Africa. He has charged the organization to “serve as NATO’s catalyst for the improvement and transformation of Joint Air and Space Power, delivering effective solutions through independent

thought and analysis”.³ To aid in this effort, the JAPCC and the JWC signed a Memorandum of Understanding (MoU) in 2012 to codify the JAPCC support to JWC-directed exercises. The JAPCC provides a critical capability to the JWC, which is necessary to achieve the level of fidelity in the larger exercises which the JWC directs. As articulated in this MoU, the JAPCC provides expertise on Air and Space Power to JWC training and exercise activities focused on delivering improved interoperability, standardization and qualitatively transformed air capabilities through exploration of concepts, promotion of doctrine development, and through the support of experimentation and research processes employing new technologies and techniques.

Since that time, the JAPCC has provided expertise supporting the JWC in the role of Opposing Forces Air (OPFOR AIR) during the TRIDENT Series of Exercises (Joint Task Force certification). Of note, the JAPCC also fulfils this same role in the Ramstein AMBITION exercise series, supporting the AIRCOM’s (Allied Air Command) component certification, as well as during KALKAR SKY exercise series, supporting the German National Air Operations Centre (AOC) certification. As such,



The installation of modern Advanced Layered Defence Systems in critical areas is being accomplished with the goal to impede NATO's freedom of manoeuvre in the Eastern Mediterranean and the Baltic Seas.

the JAPCC has accrued over five years of observing joint and component-level certifications as well as the performance of myriad levels of NATO and national Training Audiences. Many of the “food for thought” recommendations regarding NATO's exercise programme as related to Advanced Layered Defence Systems stem from these past five years as OPFOR AIR spanning multiple exercises with different scenarios and adversaries.

Furthermore, the JAPCC serves as the co-chair of the Bi-SC Maritime Air Coordination Conference (MACC), along with the Commander Maritime Air NATO (CMAN), Allied Maritime Command's “air” hat. Together with CMAN, a close relationship has been developed with Naval Striking and Support Forces NATO (STRIKFORNATO) to collectively address air and maritime component challenges to foster improved integration, as STRIKFORNATO oversees integration of U.S. Aircraft Carrier Strike Group and Expeditionary Strike Group capabilities to the Alliance. It was this past year's conference, themed “Delivering Joint Effect from the Sea”, which kicked off a deeper discussion regarding the issues each component faces, posed by Advanced Layered Defence Systems.

The timing of the MACC 2017 was juxtaposed against real world demonstrations of some of these capabilities, as the Russian Federation began not only installing new elements of the layer (an S-300 SAM system) in Tartus

Syria,⁴ but also demonstrating to the world the reach of some of their modern cruise missiles deployed from air, surface, and below the surface. Kilo class submarines and frigates firing Kalibr cruise missiles from the Mediterranean, corvettes and cruisers doing the same from the Caspian Sea, and the potential installation of advanced surface-to-air missile (SAM) systems in Syria were coalescing into a new problem set for the Alliance in the Eastern Mediterranean, which required deeper analysis and coordination by the air and maritime components. The MACC offered an opportunity to discuss some of these in detail.

Finally, as the JWC was finalizing the script and scenario for TRIDENT JAVELIN 2017, it became apparent there was not only a desire to conduct an Article 5, large scale and high-intensity major joint exercise, but also a growing need to conduct this exercise against a peer adversary in such a large simulated operation in order to more thoroughly prepare the Alliance to deal with issues presented by these particular challenges. The JAPCC served once again as the OPFOR AIR team and helped shape the scenario scripting and execution so that not only are the critical Training Objectives met by the Joint Force Command and the subordinate components, but also infusing the

joint nature of this layered defence problem into the scenario so that it was better understood by the exercise participants.

Why is the Advanced Layered Defence System challenge significant to NATO?

Part of the problem with comprehensively dealing with this issue is that the nature of the challenge is not well understood across the components or joint force. Many look at the A2/AD challenge from a systems perspective, and if a particular system does not impact them, influence their component or degrade their particular system directly, then it is assessed to be “someone else's problem”, and that assumption is usually directed toward the air component.

However, a brief overview of the issue highlights the inter-dependency of the components and why this is in reality a joint issue, which in many senses will absolutely require other instruments of National/Alliance power beyond just the military. “[A2/AD] is a family of military capabilities used to prevent or constrain the deployment of opposing forces into a given theater of operations and reduce their freedom of manoeuvre once in a theatre.”⁵ The true role of these Advanced Layered Defence



ABOVE: AN/SPY-1 Radar (NATO sea-based radar) is the key component of Aegis Ballistic Missile Defence System manufactured by Lockheed Martin. The passive electronic scanning system is computer-controlled, using four complementary antennas in order to provide full 360-degree coverage. Photo by NATO





Systems is to impede, degrade or even deny NATO freedom of manoeuvre in one or more domains. In the most extreme case against the most modern systems, it can impede action simultaneously in all domains. This challenge cannot, and will not, be solved by one component or one weapons system alone.

In-depth look into the joint nature of the problem

The domains are becoming more and more linked. The insidious nature of layering these defence systems has the secondary (and tertiary) effect of mutual overlap, creating mutual interference. The JAPCC's analysis of the problem begins in the air domain. The ranges of modern systems have been increased with the goal of pushing NATO back out of the airspace. SAM technology has increased the range of the most modern systems to approach 400 km (S-400; 248 miles). Underneath the long-range SAMs are frequently positioned short range SAMs (*i.e.* SA-17) designed to interdict kinetic kill options entering the battlespace (for example, NATO's stand-off weapons, such as Tomahawk or Scalp). Defending each critical system is another layer of air defence, best expressed by capabilities such as the SA-22 Pantsir point defence system.⁶ If a stand-off missile strike makes it past the S-400, and also past the SA-17, it still has to defeat the Pantsir before

it can achieve a kill on the long-range SAM. However, the Pantsir is typically deployed in batteries of 2-4 systems per critical node, with the capability to launch while moving at as many as ten targets simultaneously with guns and missiles.⁷

If Tomahawks/Scalps were the answer to the A2/AD problem, then NATO would not have an A2/AD problem.

JAPCC

As a demonstration of likely employment tactics in other geographic areas, open source reporting of Russian movements in Syria indicates that multiple Pantsir systems are employed as a defensive layer around the Russian air base in Latakia⁸, protecting not only the airfield, but potentially layering defence around its long-range SAM system (such as S-300) should one be fully deployed to this base. Other options to make the layers even more dense include the integration of a missile system between the S-300 and SA-22, such as the SA-17.⁹

The recent Russian exercise "Zapad 2017" demonstrated the Russian Federation's use of Kaliningrad to host many of these types of anti-access systems in an area which can easily influence deep into NATO's territory. "Russia has invested considerable energy into

developing A2/AD capabilities and carefully positioning them to maximize their strategic effect. Russia's A2/AD deployments span as far north as the Arctic down to Syria, with particular concentrations in Kaliningrad and around Crimea—a sort of 'thicket of overlapping and redundant A2/AD systems.'¹⁰

This layering of Integrated Air Defence Systems (IADS), integrated through the use of advanced early warning systems and coordinated through improvements in Command and Control (C2) systems defended by a mobile point defence capability, challenges joint Intelligence, Surveillance and Reconnaissance (ISR) and in many ways, makes TST/DT (Time Sensitive Targeting/Dynamic Targeting) strikes much more challenging.

IADS are not A2/AD; IADS are a component of A2/AD.

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Further complicating the problem for the air domain, typical airborne joint ISR collection assets are vulnerable due to the long-ranges of modern SAMs, as they frequently must often operate within the adversary's weapons systems range to generate collection. Underneath the air defence layers are capabilities that impact the maritime and land domains. Long-range anti-surface ship cruise missiles (such as the SS-N-22 Sunburn) and short and medium-range





The surface-to-air missile Pantsir-C1 missile air defence gun system on the basis of Kamaz trucks in Kaliningrad, Russia, 9 May 2016. Photo by Irina Borsuchenko, Shutterstock.

ballistic missiles (such as the SS-26 Iskandar/Stone) have been designed to counter NATO's anti-missile defence technology, although to what extent is uncertain. What is certain is that these types of missiles are typically located under the air defence umbrella described above, protecting them from stand-off weapons and making the challenge of "rolling back" these systems to enable maritime and land manoeuvre much more difficult. Technological development into using ballistic missiles in an anti-shipping role, such as the PRC's DF-21, which could potentially be launched from ships or aircraft such as the H-6N bomber,¹¹ and also into hypersonic anti-shipping missiles—the SS-N-33 Zircon ASCM may approach Mach-6 when fielded¹²—is ongoing.

IMPROVEMENTS TO the naval launched cruise missiles have resulted in not only increased range, but also an ever-increasing array of platforms from which they can be deployed. The Russian Federation has em-

ployed Kalibr cruise missiles from Kilo class submarines, corvettes and cruisers, as well as air launched cruise missiles in combat over Syria. To make this more problematic, Russian Defence Minister Sergei Shoigu announced in July 2015 that Russia "will boost the number of cruise missiles fivefold in the next three years and by 30 times by 2020."¹³ These can influence not only the maritime environment, but also the fielded land forces throughout much of NATO's territory.

Submarines present a unique challenge. Although locating, tracking and being prepared to engage submarines is a core competency of the Alliance, the two most recent NATO Summits declared anti-submarine warfare (ASW) as a priority shortfall area. Additionally, recent studies within the JAPCC and across the maritime community have shown that the proficiency of NATO in this area has declined along with nations fielding a dwindling number of ASW assets.¹⁴ Furthermore, maritime patrol aircraft and ASW helicopters

are not able to operate inside an adversary's SAM range without other types of protection, made problematic by the existence of those same anti-access systems.

Finally, Russian submarine building has been on the rise, to include the fielding of three new classes of submarines. Indeed, Borei SSBN ballistic missile submarines are planned to replace the ageing Delta class; Yasen SSGN (nuclear guided missile submarines) are planned to replace the Oscar II class; and the Lada SSK attack submarine will augment and replace older Kilo class SS/SSK submarines. These new boats are designed to be quieter and capable of a larger set of mission portfolios than previous versions. Russia has also re-established the Black Sea Fleet in an effort to re-introduce a permanent submarine presence in the Mediterranean Sea.¹⁵

In addition to submarines, naval mines further complicate the undersea picture. Although most effective in chokepoints and shallow water, naval mines can be deployed in





Roll out ceremony of Russian nuclear submarine K-561 "Kazan" (Yasen class), Severodvinsk, Russia, 31 March 2017. Photo by Kuleshov Oleg, Shutterstock.

a variety of manners to degrade and impede maritime freedom of manoeuvre. "Today, stealthy mines made of fibreglass in sonar-deflecting shapes lurk amidst the clutter of the sea floor. There are buried mines covered by layers of sand, mud, and silt that no sonar currently in service can penetrate. There are 'rising mines' that wait in deep water for a ship to pass overhead, and then ascend until they are within range to fire a torpedo: Russia has one that fires a version of their supersonic, super-cavitating Shkval. There are reports that China is working on an anti-aircraft mine that can detect a low-flying helicopter—one towing minesweeping gear through the water, for example—and launch a missile at it. There are mines activated by a ship's magnetic field, by the sound of its propellers, by pressure differentials in the water as a ship passes overhead. There are mines that detect all of the above, then cross-check

"There is more activity from Russian submarines than we've seen since the days of the Cold War. This is very different from the period of quiet submarine activity that perhaps we've seen in the past. It is a level of Russian capability that we haven't seen before. The Russian Navy accomplished this through an extraordinary investment path not mirrored by the West and has made technology leaps that [are] remarkable, and credit to them."¹⁶

*Vice Admiral Clive CC Johnstone
Commander Allied Maritime Command*

between different types of sensors to make sure they are not fooled by a decoy. There are mines smart enough to distinguish different kinds of ships and only wait for a chosen target, only oil tankers for example, or only aircraft carriers. There are even rumors of Chinese and North Korean mines with nuclear warheads."¹⁷

NATO has dedicated two entire Standing Naval Task Groups, SNMG 1 and 2, under Operational Control of Allied Maritime Command, to deal with the mine threat. However, finding the minefield and clearing the minefield takes a significant amount of time. Furthermore, this mine clearing activity will likely have to occur under an adversary's robust layered air defence and cruise missile layer, and the assets which perform this activity must be defended, as their self defence capability is limited.

In the non-kinetic domain, advances in Electronic Warfare (EW) have challenged



NATO's dominance in the electromagnetic spectrum. Jammers, such as the truck-mounted Krashuka-4, are specifically designed to counter NATO's Airborne (early) Warning and Control System (AWACS) and ISR capability and may even have the potential to damage equipment in addition to jamming the spectrum.¹⁸ To further complicate the targeting process, the use of decoys, to include infra-red and mobile decoys, will likely be prevalent. The use of cyber effects to further hamper freedom of manoeuvre has a supporting role to these other kinetic effects and will likely be part and parcel of any peer adversary's actions. This concept has been demonstrated in Russian operations in Estonia and Georgia,¹⁹ although complete attribution remains uncertain.

Finally, the existence of these Advanced Layered Defence Systems generates the possibility of sanctuary areas for opposing aircraft to operate, assemble in a location at a time of their choosing, and then use mass to push back defences and strike against targets on land, sea or in the air. This notional concept is a tactic that OPFOR AIR exploits in many exercises, to temporarily overwhelm defences to enable strikes; then the aircraft retreat into their sanctuary, back under the defensive umbrella and remain relatively protected from a counter-strike.

All of this demonstrates the multi-



FGS ROTTWEIL, a part of Standing NATO Mine Counter Measures Group Two, launching the autonomous underwater vehicle "REMUS" during EXERCISE POSEIDON 17 mine hunting drill, Black Sea, 10 March 2017. Photo by CPO Christian Valverde, HQ MARCOM

domain nature of the problem, which cannot, and will not, be solved by one weapon system, one service, or one component of the NATO Command Structure (NCS). Addressing the challenge requires detailed Centre of Gravity (CoG) and critical vulnerability analysis, through a joint and inter-agency thought process. Preparing for this, NATO should take a hard look at the conduct of its exercise programme to further emphasize the joint nature

necessary to address this problem. It is clear that not every exercise is the same and not every Training Audience reacts the same way to stimuli, therefore this section should be taken as a synopsis of five years of observation rather than an analysis of one team's performance in one particular scenario.

Rolling back these systems will take time. Time measured not in "hours", rather "weeks or months".

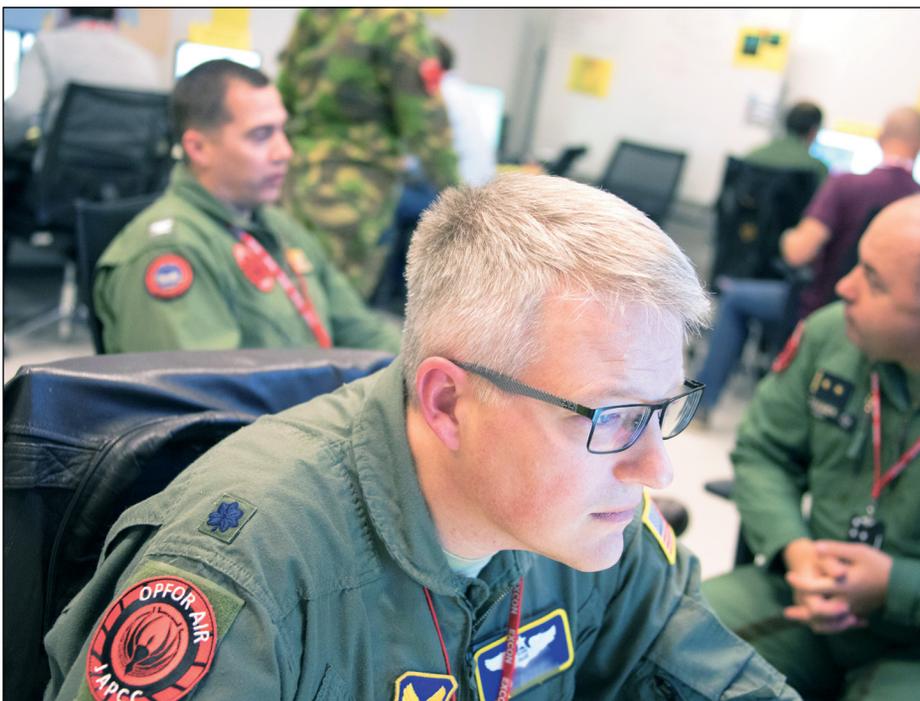
JAPCC

Aspects of the challenge the Alliance should consider in exercises

In the process of preparing for operations in this environment, NATO has conducted exercises focused on re-experiencing challenges that are unique and distinct from missions as far back as Operation DELIBERATE FORGE over Kosovo. In that campaign, and in every endeavour since, NATO has enjoyed the luxury of both a permissive air environment and complete freedom of manoeuvre in the maritime domain. Neither of these two conditions is guaranteed in the future. In fact, many assess them as unlikely starting conditions for any future conflict. Learning to deal with the capabilities brought a peer—or near-peer—adversary that is challenging NATO in many ways.

The following observations have been

BELOW: OPFOR AIR during Exercise TRIDENT JAVELIN 2017, Joint Warfare Centre. Photo by JWC PAO



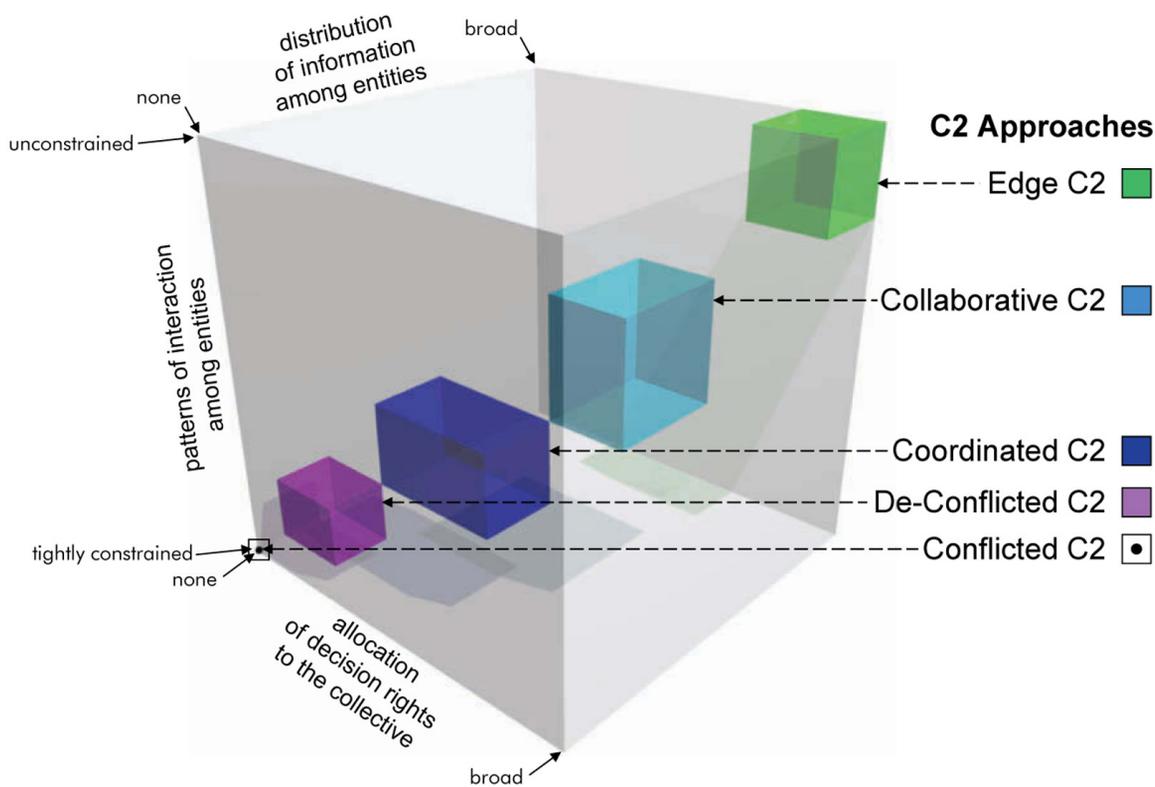


Figure ES 1: C2 Approaches as regions in the C2 Approach Space

ABOVE: The NATO Network Enabled Capability (NEC) Maturity Model. This model was developed by the RTO SAS-065 Research Task Group, chaired by Dr David S. Alberts from the U.S. Department of Defense, over a period of about three years. It defines a number of C2 approaches, ranging from Conflicted C2 to Edge C2, that correspond to different regions within the C2 Approach Space. (NATO NEC C2 Maturity Model, www.dodccrp.org).

compiled from exercises spanning 2012-2017 and covering the Training Audience responses to challenges presented by the *SOROTAN* and *SKOLKAN* scenarios, which are the scenarios created by the JWC and used for many National and NATO Component and Joint Force Command certification exercises.

Stand-off weapons: There is a growing realization that the range of the weapon systems involved precludes the use of stand-off weapons as the sole method to address the problem. This is due not only to the respective ranges of the long-range SAMs and the early warning detection capability, but also to the increased ability to engage the stand-off weapons when the systems are layered in a manner as previously outlined. (*Editor's Note: Observations on NATO's use of standoff weapons in exercises as well as joint integration may be found by accessing the full article on JWC's NATO SECRET Intranet website portal.*)

NATO's Command and Control (C2) maturity level: The NATO System Analysis and Studies (SAS-065) NEC model, (Figure ES 1 above), outlines levels of C2 maturity in an effort to delineate those things, which may be addressed to improve C2 in the future. (*Editor's Note: Observations on NATO's C2 maturity level may be found by accessing the full article on JWC's NATO Intranet website portal.*)

What works in exercises?

- Exposure to different levels of opponents, operating at different levels of technology, spanning from hybrid/asymmetric to peer competitor, in order to educate NATO staffs about various types of standard and non-standard tactics that may be encountered, and the capabilities required to defeat them.
- Recognition that freedom of manoeuvre in air, land and maritime must be earned, not granted as part of "scripting".

- Exposure to a realistic representation of peer adversary capabilities and tactics, not a restricted version of a peer adversary.
- Acceptance of the tactical assessments made by the Exercise Control (EXCON) team.
- Focus on a steep learning curve. Deal with a challenging scenario, which causes the Training Audience to at first *fail/struggle*, then *assess* why the plan did not go as scripted, *adapt* the plan and *improve* their performance during the next iteration of those Training Objectives.
 - Learning to deal with degradation and loss of capabilities. This will happen in reality, we must prepare for it by training to this level.
 - Losing aircraft/ships in a simulator as a result of flaws/errors in planning and execution, then incorporating the reason why it happened in order to prevent reoccurrence in the next exercise battle.
 - The end goal of this is to improve protection of NATO's high value assets. This



What they said

AS AN ALLIANCE, WE NEED TO STEP BACK AND TAKE A LOOK AT OUR CAPABILITY IN A MILITARY SENSE TO ADDRESS AN A2/AD CHALLENGE. WE MUST INCREASE THE READINESS AND RESPONSIVENESS OF THE ENTIRE NATO FORCE STRUCTURE. WE HAVE TO GET TO THESE INVESTMENTS, EXERCISES, AND TRAINING SCENARIOS THAT RAISE THE RESPONSIVENESS AND READINESS OF THE WHOLE FORCE.

GENERAL (RET.) PHILIP M. BREEDLOVE, FORMER SACEUR

**IF YOU WANT PEACE,
PREPARE FOR WAR.**

*ROMAN GENERAL VEGETIUS
"EPITOMA REI MILITARIS"*

NO WAR IS OVER UNTIL THE ENEMY SAYS IT IS OVER. WE MAY THINK IT OVER, WE MAY DECLARE IT OVER, BUT IN FACT, THE ENEMY GETS A VOTE.

*GENERAL (RET.) JAMES MATTIS
U.S. DEFENSE SECRETARY,
FORMER SACT*

THE DEPLOYMENT OF A2/AD CAPABILITIES CAN ALSO BE SEEN AS A SHOW OF FORCE AND INTIMIDATION.

*NATO DEFENSE COLLEGE REPORT, FEBRUARY 2016:
"TOWARDS A NATO COUNTER A2/AD STRATEGY"*

THE COMMAND STRUCTURE IS THE BACKBONE OF OUR ALLIANCE. IT IS WHAT ALLOWS ALL OUR NATIONS TO PLAN, PREPARE AND, IF NECESSARY, TO FIGHT TOGETHER AS ONE.

JENS STOLTENBERG, NATO SECRETARY GENERAL

THE PROBLEM WITH THE A2/AD TERM IS THAT IT CONFLATES STRATEGY WITH TACTICS IN A WAY THAT NEGLECTS THE NON-MILITARY ASPECTS OF ANTI-ACCESS WARFARE, MINIMIZES THE ROLE OF DETERRENCE, AND FOCUSES US 'LIKE A LASER BEAM' ON TACTICAL ANALYSES ON HOW PARTICULAR OPPOSING WEAPONS SYSTEMS WILL PERFORM.

ADMIRAL JOHN RICHARDSON, U.S. CHIEF OF NAVAL OPERATIONS

Maintaining Air Superiority: F-35 Joint Strike Fighter aircraft. Developed by nine countries – Australia, Canada, Denmark, Italy, the Netherlands, Norway, Turkey, the United Kingdom and the United States – the F-35 is the world's premier fighter aircraft, combining advanced stealth with speed and agility. Photo by NATO



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might be achieved by learning a hard lesson in a synthetic environment, rather than losing one for real in operations.

- Utilization of a detailed joint targeting process, including ISR and weaponeering.
- Recognition of the time, effort, stockpiles and resources, which will be consumed to degrade any layered defence system. Furthermore, it is realistic that NATO is likely to take losses during this phase, and this has impacts well outside the military audience.

There needs to be a culture change to accept that it is better to lose in an exercise than to lose in live battle.

(Editor's Note: Observations on Training Audience specific performance trends may be found by accessing the full article on JWC's NATO SECRET Intranet website portal.)

Opportunities for improvement

1/ Exercise design: The exercise design should capture the component friction points, and reinforce integration, and stimulate a joint approach to problem solving. This can be done both through Table Top Exercises with senior leaders as well as through Command Post Exercises (CPX), such as the TRIDENT Series. The idea is to expose Command Group and senior staff to the challenges which Advanced Layered Defence Systems impose on the joint force and their subordinate components in



Air Marshal Stuart Evans, Deputy Commander of Allied Air Command (AIRCOM), during a briefing at JWC. Photo by JWC PAO

a smaller forum, prior to the larger scale exercises that involve myriad levels of forces. It is not important whether NATO or OPFOR is winning at the end of an exercise. The key issue is that lessons are identified and truly learned.

2/ Improve Centre of Gravity analysis of the Advanced Layered Defence System: Not only is intelligence required to determine the location of systems for strike, but a deeper

analysis of the adversaries' vulnerabilities and weak points is necessary to determine the best method to achieve degradation of the system as a whole. Finding and degrading the critical vulnerabilities—the "Integration" part of IADS, as an example—is necessary for shaping operations upon entry into the Joint Operations Area. Furthermore, we need to be agile enough to respond to incremental success and adapt the plan to exploit a window that the opponent will work diligently to close as fast as able. We need to improve synchronization across the force, to include joint targeting and joint prioritization of effort.

Integration of stealth and other fifth generation technology into a solution is critical, but stealth is not a panacea and not a sole source solution to A2/AD

3/ Consider more live exercises that force component interoperability: Live training was something the Alliance did extremely well in the Cold War, but that skillset has atrophied to some extent. In that era, upon passing on the seas, it was *de rigueur* for ships from different nations to exchange classified



NATO's TRIDENT JUNCTURE 2015, LIVEX (Live Exercise): Picture shows U.S. Marine Corps MV22s on board HMS OCEAN. Photo by NATO



communications and join each other's datalink in an effort to ensure systems interoperability of their respective equipment. Today, the maritime and air components are re-learning the basics of passing the recognized air picture due to technological advancements in the components that were not synchronized during development, as well as due to an ever-growing process within the nations and the Alliance writ large for systems certification.

There is an ongoing effort to re-energize the basics, but the NATO Alliance frequently does live training at the component level only, and often overlooks the benefits of live joint level training. As an example of this, when is the last time NATO conducted an exercise where the maritime component fought to the beach under protection and coordination from the air; debarked and landed the amphibious force, which then conducted a transfer of authority to the land component, rather than re-embarking?

A mindset shift is necessary

Many of the items in this article are a mindset shift for many Nations of the Alliance. This is not to espouse that NATO should plan to fail in exercises, rather that NATO should seek to foster a training environment that permits high-intensity learning, to include "failing to induce adaptation to achieve success" as an acceptable method of learning. We need to move beyond the days when OPFOR is handcuffed in order to truly demonstrate the impact unexpected tactics from a peer competitor can have on a well-crafted plan. This is not a short-term proposal, but one that requires a hard look in the mirror and then acceptance of a need to change; otherwise we will continue to struggle adapting the highest levels of hard, challenging exercises to truly reflect what NATO might actually encounter against a peer who fights by a different rule set.

Finally, there is a balance which must be struck between "training" exercises and "certification" exercises. Various efforts are ongoing within the Alliance not only to streamline the exercise schedule, but also to synchronize it in such a way that they become mutually supporting, laying the building blocks for certification through one comprehensive scenario experienced as a campaign plan over the course of a series of exercises. This will go a long way



ABOVE: Italian Radar Unit supporting Exercise RAMSTEIN DUST II-17. The picture shows Italian AN/TPS-77 radar at its deployed site at Liepaja, right on the shores of the Latvian Baltic Sea coast. Photo by Kevin Lemée, AIRCOM.

toward satisfying the respective different experiences each component needs to see throughout their training cycle, which at times are in opposition. As an example of this friction, it has been expressed that the maritime and air components value the early stages of conflict in their training, as "fighting to get to the fight" is a skillset that must be retained and regularly exercised. However, this precludes the land component from simultaneously meeting their training needs, which occur a bit later in the campaign phasing.

Conclusion

This article addresses NATO's preparation and conduct in exercises against the threat posed by the modernization of the Advanced Layered Defence Systems of a potential near-peer adversary. These are unclassified observations of the behaviour and conduct of various Training Audiences across the Alliance and are neither intended to be extended to an assessment of preparation for actual operations, nor to provide an assessment of one particular weapons system's ability to operate against another, as

those observations would be classified. However, even at an unclassified level of discussion, there is much that can be gleaned from our current method of exercising and preparing to conduct each of NATO's three core tasks—Collective Defence, Crisis Management and Cooperative Security.

By improving our exercise programme, adapting to the concept that a near-peer adversary "gets a vote" and will do unexpected things that impact NATO's planning and execution cycle, improving our understanding of how to conduct operations in a degraded/contested environment, such as that presented by Advanced Layered Defence Systems (including improving our detailed Centre of Gravity analysis of these systems), will better prepare the Alliance for potential future operations.

NATO retains the advantage and will likely win scenario requiring the use of military force, but "losing less, while winning" is a matter of how well we understand our adversary; understand the impact of their systems on our systems, and how well we are able to operate in a joint manner, maximizing the efficiency of our resources and assets. ✦





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