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FIGHTING TO SHARE: CONTROLLED UNCLASSIFIED INFORMATION (CUI) TTP FOR TACTICAL ORGANIZATIONS

US Army infantry Soldiers with the 2nd Stryker Brigade Combat Team, 7th Infantry Division, instruct a team of soldiers from 112th Infantry Regiment, Royal Thai Army, during a dismount training exercise during Cobra Gold 2022 in the Lopburi Province of the Kingdom of Thailand, February 26, 2022. (Photo by Spc. Andrew Mendoza)

By MAJ Jon Page, USA

On March 6, 2020, the Office of the Under Secretary for Defense and Intelligence published Department of Defense Instruction (DODI) 5200.48, *Controlled Unclassified Information (CUI)*. The publication of initial standards and implementation represented a culmination of executive branch efforts begun in November of 2010. According to Executive Order (EO) 13556, the President of the United States recognized that "executive departments and agencies employ ad hoc, agency-specific policies, procedures, and markings to safeguard and control … information that involves privacy, security, proprietary business interests, and law enforcement investigations."[1] EO 13556 represented the efforts of the Obama administration to standardize controls for unclassified information in the interests of both protection and transparency.

Yet, since March 2020, implementation of DODI 5200.48 has not been smooth or clear for the individual Services, the Joint Staff, or the Department of Defense as a whole. One of the effects of the implementation has been the creation of a potential barrier to information sharing with partners and allies. Use of CUI involves specified guidelines for its electronic protection which may create unnecessary barriers to efficient disclosure and negative consequences to partner trust. The joint force must address the challenges created by poor implementation of CUI procedures to ensure multinational information flow is not negatively impacted in the future. This article will offer some background on classification in general, including the negative effects of over-classification. It will describe these effects on US partners and allies. From there, it will review the framework within CUI policy and its effects on foreign disclosure. Fi-

nally, it will provide recommendations for organizations to better align US CUI policy in the interests of greater transparency to achieve shared goals with our partners.[2]

In 2017, roughly four million Americans holding security clearances generated fifty million classified documents. Officials including former director of the National Security Agency, Michael Hayden, have complained these number represent systemic over-classification within the executive branch. In 1971, Supreme Court justice Potter Stewart remarked in a court opinion, "When everything is classified, then nothing is classified, and the system becomes one to be disregarded by the cynical or the careless, to be manipulated by those intent on self-protection or self-promotion." The current administration of classification policies might have a hand in over-classification. Mistakes in under-classifying are clear, carrying administrative and possible legal penalties as well as threatening national security. Over-classifying carry no such penalties. Greater secrecy can also create barriers to effective and efficient information sharing, as demonstrated in the 9/11 Commission Report. The terrorist attack on 9/11 might have been prevented with greater information sharing, thus informing decision-making or making the public aware to greater dangers.[3]

These are problems with classified documents and information. Part of the reason for the issuance of EO 13556 was in response to the adverse effects of over-classification on unclassified information. It sought to standardize the various executive branch caveats for unclassified information, such as defense use of 'For Official Use Only' and police force use of 'Law Enforcement Sensitive.' Not only did each caveat come with its own marking criteria, often poorly understood by other organizations, it created a hodge-podge of criteria for use, instructions for electronic sharing and storing, and penalty for misuse of criteria and instruction. Documents were not frequently interrogated for the rationale behind their caveats on unclassified documents, resulting in greater use of the caveats. As the caveats were brought under encryption requirements within email use and storing, not only were they withheld from public oversight in some instances, but they also became restricted from our international allies and partners. EO 13556 was meant to address these concerns. Yet, the defense department instructions for implementing the executive order, DODI 5200.48, has created confusion and initially has not eliminated the problems with unclassified caveat usage.[4]

Under the new framework, unclassified information exists in two forms. The first form is simple unclassified information without caveats or controls. This unclassified information requires no specific safeguarding related to its storage and transmission in print or electronic media. The second form is unclassified information with specific controls, *controlled unclassified information*. As we have discussed, the DOD has published a framework for identification, storage, and dissemination of CUI. First, DODI 5200.48 has created a DOD CUI Registry to align all the disparate categories under which DOD was previously caveating unclassified information (such as FOUO-For Official Use Only). Second, the DODI instituted specific marking criteria for CUI, including a specified five-line designation indicator identifying the rational, controls, and controlling agency. Figure 1 shows an example of this designation indicator. This designation indicator is meant to address the problem of not being able to identify the origination of controls as many organizations do not require Security Classification Guidance use in previous caveats for unclassified information (e.g., FOUO).[5]

The Intelligence and National Security Alliance (INSA) has identified several problems with the implementation of CUI policy within the DOD and Intelligence Community.

The Intelligence and National Security Alliance (INSA) has identified several problems with the implementation of CUI policy within the DOD and Intelligence Community. Specifically, they describe the implementation as "complex, confusing, and costly." The complexity issue should be acknowledged. Not only does the CUI program identify 20 groupings and 125 categories for identifying unclassified information as requiring additional controls, but agencies are also left to implement CUI program independently of each other, creating complex and confusing rules for each agency. For instance, the Department of Defense follows DODI 5200.48 as its foundational document for the CUI program. This document identifies controls to be used, such as caveats including no foreign dissemination (NOFORN), REL TO (Releasable To), and other caveats. Additionally, DODI

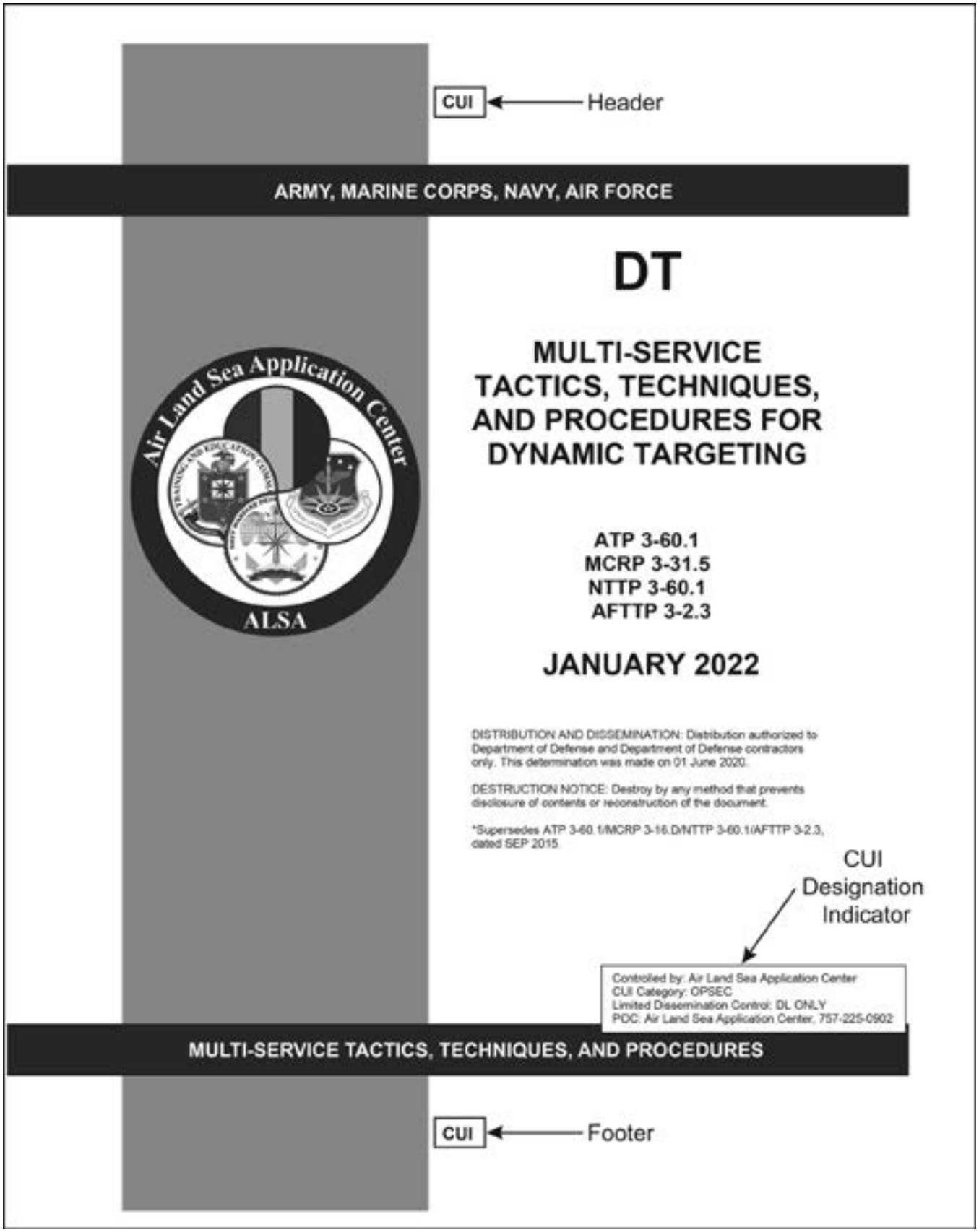

Figure 1. Example of CUI markings including Designation Indicator[6]

5200.48 identifies that previously marked CUI, such as doctrine publications marked under distribution statements and documents identify as FOUO, should be reviewed, and updated with the new markings.

This complexity and confusion compounds when factoring in foreign disclosure and release of information to partners and allies. Foreign disclosure officers are typically trained and given authority to

conduct review of classified information for release to partners and allies. Typically, they are trained to review security classification guidelines (SCG) and coordinate with classification authorities (as identified in cover statements and sourcing material) to determine redactions and release to partners and allies in a timely fashion. The CUI program has created more complexity for that role. Now, disclosure officers have an entire new set of unclassified caveats to review and in the implementation phase of the program, confusing criteria for identification (CUI documents do not currently require portion marking), coordination (many CUI documents come without the specified cover information – see Figure 1), and review (security classification guidelines are being updated concurrently with the implementation of CUI). Finally, CUI program implementation requires encryption of CUI documents and information, resulting in the inability to rapidly transmit unclassified information to partners and allies, unless they hold a US generated email or other US digital account.[7]

So, what can organizations do to ensure information sharing with partners and allies is not interrupted by imperfect implementation of the CUI program? There are three specific recommendations to implement, which may be instituted at organizations with more than 100 personnel. First, organizations should aggressively implement the use of the specified cover CUI designation indicators for their CUI marked documents. Second, operations security (OPSEC) officers should be placed in charge of releasing and updating controls for OPSEC identified non-portion marked CUI documents. Finally, OPSEC officers and foreign disclosure officers should retain freedom to update CUI controls for improperly marked documents, including those without adequate cover information.

All CUI marked documents in the DOD require cover designation indicators. Yet, in the implementation phase of the CUI program, many documents simply do not have these cover statements. Organizations identifying unclassified information should aggressively review and place these indicators. This ensures that the proper rational has been used in identifying why a document requires controls, identifies those controls, and provides the agency to contact with questions about those controls. Ensuring all that information properly exists within a cover designation indicator will ensure efficiency in disclosure review and release.

A clear CUI category is OPSEC and many legacy FOUO documents and newly identified CUI at operational organizations are identified for safeguarding due to the need to protect information for OPSEC purposes. The proper reviewer of documents identified as such should reside with the organizational OPSEC officer until the CUI program matures. These OPSEC officers will be better able to identify needed redactions for information identified for release from their organizations and will also be able to understand timing and questions to ask of other organizations in determining release criteria for derivatively received CUI documents. They should retain freedom to add additional controls to ensure timely release of OPSEC marked documents to allies and partners.

Documents marked CUI with appropriate REL TO identification should be available for transmit outside of encrypted channels. Using OPSEC officers in this role will also allow foreign disclosure officers to focus on their own procedures in classified reviews and free time for the foreign disclosure officers to review other CUI categorized documents. At this stage of CUI implementation, many documents will come into organizations without proper cover designation indicators. At this point, OPSEC and foreign disclosure officers should retain the freedom to either add a cover designation following review or add additional caveats in the interest of expedited sharing to partners and allies through the application of REL TO statements.

While CUI implementation has been in development for more than a decade, the actual practice has resulted in complexity, confusion, and cost. Much of that cost has been in the form of reduced efficiency and effectiveness in transmitting CUI marked documents to our partners and allies. Organizations within the Joint Force may best address the challenges in poor implementation by aggressively ensuring cover designation indicator use, allowing their OPSEC officers to review and release OPSEC identified CUI, and retaining the freedom to release improperly marked CUI as mission demands require. Organizations that follow these recommendations may ensure that multinational information flow to allies and partners does not suffer negative impacts to information sharing.

MAJ Jon Page served in various positions including assignments in the 10th Mountain Division, the 1st Cavalry Division, and the US Army Headquarters. He previously served as a Joint Action Officer at the Air Land Sea Application Center.

END NOTES

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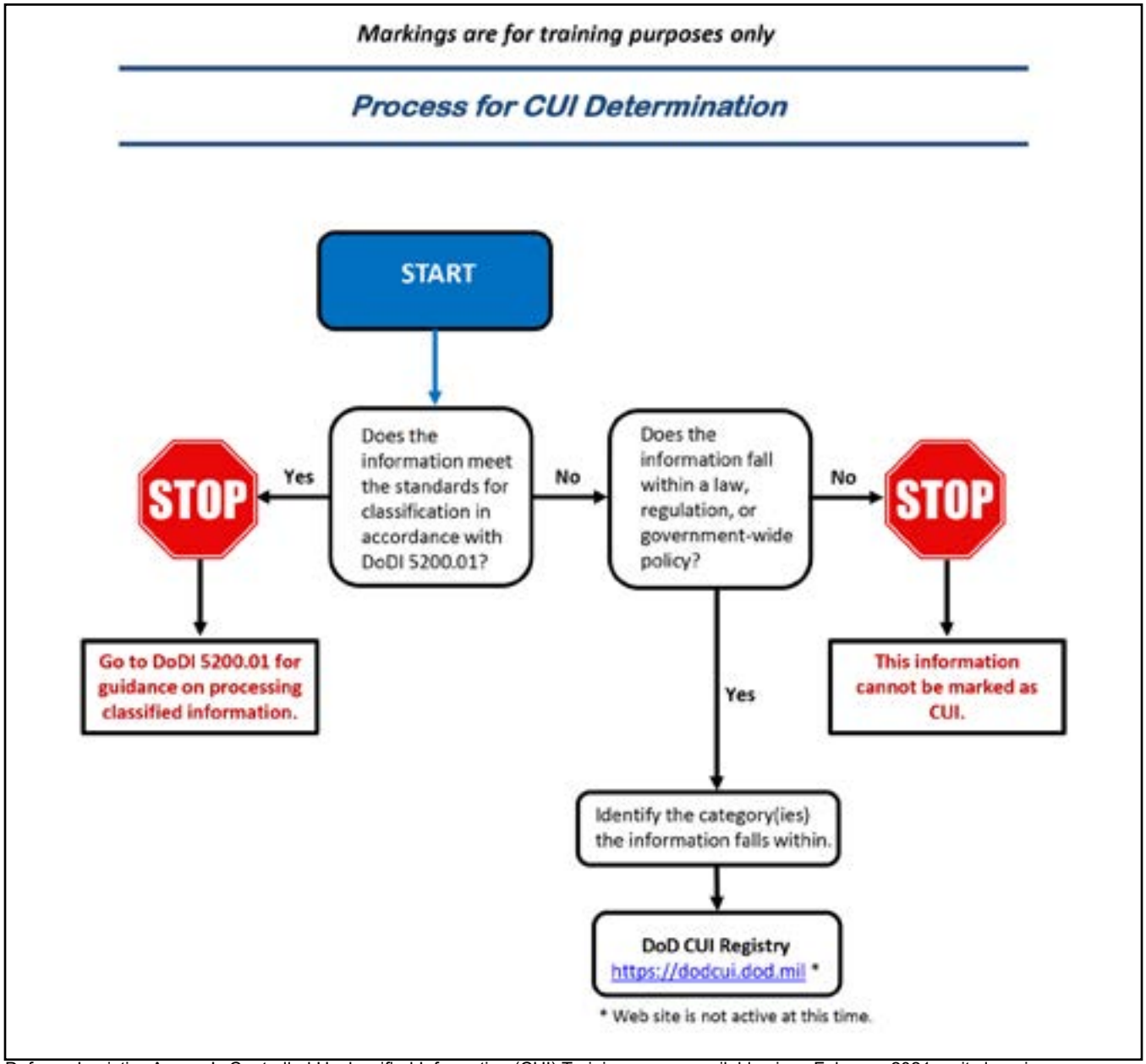

Defense Logistics Agency's Controlled Unclassified Information (CUI) Training course available since February 2021 on its learning management system platform provides a flowchart to help employees determine if information should be mark as controlled unclassified information. (DefenseDepartment graphic)

NO MAN'S LAND, PEANUT BUTTER, AND ARMY AVIATION: THE CASE FOR A FOURTH BCT TYPE AND REORGANIZING THE US ARMY FOR A 200 MPH BATTLEFIELD

By LTC Beau G. Rollie

"Klotzen Nicht Kleckern (Translated: Hit With the Fist, Don't Feel with the Fingers."—General Heinz Guderian

The United States (US) Army currently has 12 active Combat Aviation Brigades (CABs), and like peanut butter on a sandwich, each of the Army's ten active-duty divisions enjoys its own evenly spread CAB. The cost of equality in aviation support across the Army is paid by sacrificing our ability to conduct independent operational maneuver at air-mobile speeds.[1] Current American operational formations cannot assure US land force domain overmatch against peer competitors. To maintain land dominance the US Army must create a fourth Brigade Combat Team (BCT) type, the Air-Mobile Brigade Combat Team (AMBCT), and further we must arrange AMBCTs into air-mobile divisions aligned under an air-mobile corps. Our minimum benchmark for operational maneuver must include at least two divisions, able to lift by air, with all assets moving at air-mobile speeds up to 200 mph.[2] To state the problem simply, we have Armor divisions with enough armor, why don't we have Air-Mobile divisions with enough helicopters?

This article will convince/remind the reader that: 1) Army aviation with organic infantry is capable of autonomous maneuver 2) operational maneuver at air-mobile speeds is game-changing 3) air mobility is about penetration through the third dimension, seizure of positions of relative advantage, and successive maneuver to new advantageous positions to force the enemy to dislocate and eventually capitulate.[3] US Army aviation helicopters with organic air-mobile infantry massed into brigades and divisions would maintain US force dominance through maneuver overmatch. Additionally, organizing US land forces for operational maneuver at air-mobile speeds and distances will enable us to outpace peer threats while better challenging enemy anti-access/area denial (A2AD) efforts.

> Outpacing peer threat maneuver and firepower is a major concern on today's "multi-domain" battlefields.

Outpacing peer threat maneuver and firepower is a major concern on today's "multi-domain" battlefields. Throughout the history of warfare, the balance between maneuver and firepower remained in constant flux. Notably, the World War I western front stands as a strong example of a time when firepower took primacy over maneuver, resulting in a four-year stalemate where both sides struggled to gain or maintain initiative. Maneuver did not re-take primacy over firepower until the adoption of massed mechanized warfare in the 1940s. Looking forward to current times, the balance between maneuver and firepower is at another nexus point where "multi-domain" and "A2AD" effects are poised to shift combatant's focus from maneuver/offense back to firepower/defense. Potential peer competitors currently wield fires and multi-domain effects, including cyber and Electronic Warfare (EW), that strike with great accuracy and can affect vast stand-off distances,4 thereby creating a modern equivalent of the WW1 "no-man's land" spanning vast distances.[4] Considering the A2AD capabilities our competitors will employ to create this "no-man's land", our Army must apply the tried and true principles of combined arms maneuver to mass effects at decisive spaces of our choosing to gain and maintain initiative.[5] The best way to ensure our ability to maneuver decisively against enemy multi-domain effects is to mass superior maneuver capabilties.[6] Massed air-mobile forces are America's best option to achieve superior land domain maneuver, and if

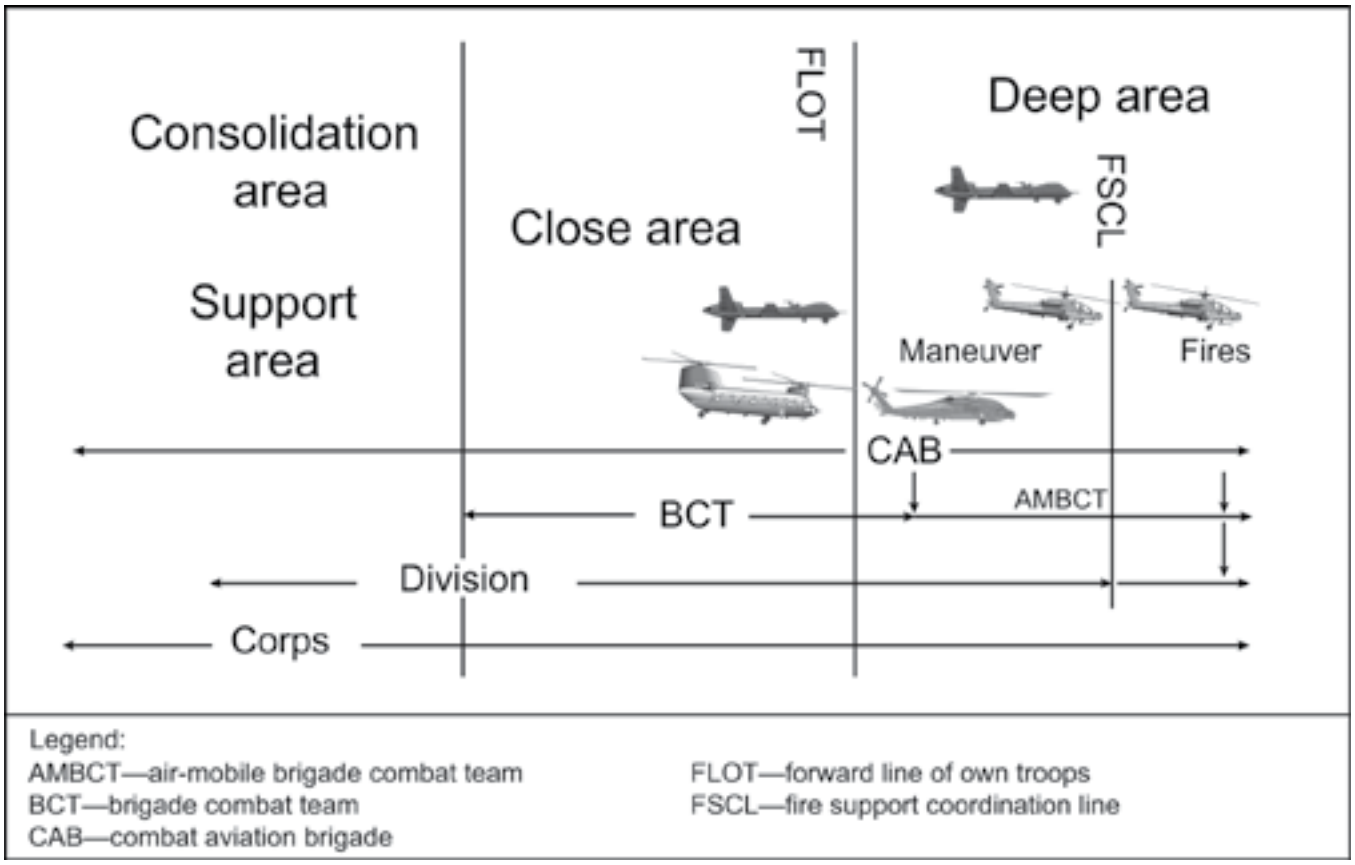

Figure 1. Corps area of operations within a theater of operations.

used operationally, rotary-wing aircraft would ensure effective convergence of effects, especially in deep areas.[7] Air-mobile forces applied en- masse are uniquely suited for modern operational maneuver, possessing the necessary capabilities to overcome limiting terrain and prosecute enemies in deep areas.[8]

In the defense, air-mobile tactics can help commanders limit tactical risk by enabling friendly force dispersion until offensive capability is required. When offensive capability is needed, air-mobile forces can mass rapidly and cross the modern no-man's land to penetrate enemy lines in the third dimension with fewer limitations than light or mechanized counterparts.[10] Dispersion, quick concentration, and rapid power projection across vast distances are the advantages that define air mobility. Air-mobile forces can maneuver at speeds of 150-200 MPH out to operational distances (200-500 kilometers), which enables seizure of key terrain or interdiction of enemy lines of communication. Simply put, massed air-mobile infantry can sustain operations at speeds and distances impossible for light or mechanized infantry, but our current Army force structure does not support operational air-mobile maneuver.

US land forces are not currently organized to outpace peers operationally at air-mobile speeds and distances. Modern mechanized and armor divisions are limited to two-dimensional maneuver and they cannot move fast enough or far enough to overcome current A2AD tactics and systems. Current US Army operational force structures have a 50 MPH maximum speed, defined by the Armored Brigade Combat Team's (ABCT) rate of march.[11] The 50 MPH speed limit has not changed significantly since WWII and is tied to the speed of our primary land combat vehicles (M1, M2/M3, and Strykers). We should strive to increase this speed limit by organizing into brigades and divisions capable of moving at 150-200 MPH. To increase our speed to the higher limits, we should concentrate Army aviation and infantry into AMBCTs and an air-mobile corps. Driven by the superior mobility and accompanying firepower of helicopters and unmanned aircraft systems (UAS) paired with organic infantry, we could optimize our formations for independent operational maneuver at 200 MPH.[12]

Increasing the speed and operating range of Army ground forces is crucial to enabling us to outpace potential competitors. If we can consistently outpace our enemies, our mobility becomes a potent psychological weapon able to terrify, bewilder, and

sow confusion in enemy rear areas.[13] If the US Army is able to consistently maneuver air-mobile brigades and divisions in the deep area, our mobility is weaponized. Mobility as a weapon isolates, disrupts, and eventually dislocates enemy frontline troops while defeating enemy sustainment or reserve forces. If done correctly, operational air-mobility presents enemies with multiple significant dilemmas, thereby challenging the enemy's will to resist.[14] Massed rotary wing assets paired with organic air-mobile infantry are the assets best poised to use mobility as a weapon, but to achieve true success, all assets within the BCT to Corps must move at the same speed.

Massed rotary wing assets paired with organic air-mobile infantry are the assets best poised to use mobility as a weapon ...

HISTORICAL PERSPECTIVES

Large formations with assets possessing matched speeds have been hallmarks of successful military force structure for hundreds of years. Civil War Horse cavalry units were completely mounted with every Soldier moving at horse speeds. In the 20th century, Soldiers swapped their horses for armored vehicles, with every Soldier riding a tank or armored personnel carrier into battle. Army helicopters became the next cavalry evolution by trading tanks for helicopters, but air-mobile formations have fallen from favor since the Vietnam War. To understand the obstacles blocking the creation (or re-creation) of operational level air-mobile formations, one must examine the historical struggles which took place prior to the advent of both mechanized and air-mobile warfare.

Regarding the creation of mechanized forces, the British, French, and Germans all dabbled in armored warfare during WWI. WWI combatants used tanks as infantry support weapons to punch through no-man's land to aid light infantry attacks which could not penetrate independently. To overcome the stalemate caused by trenches, machine guns, and artillery, tanks were invented to protect from artillery while rolling over obstacles combinations that were previously insurmountable to regular infantry. The problem with early tanks was durability because the tanks would break-down before moving far enough to achieve operational breakthroughs.

Shifting focus to WWII, the German Army was the first military to prove the efficacy of mechanized mobility at the operational level of war. Specifically, during the Battle of Sedan in 1940, the German army rode their tanks into history by defeating the numerically superior French and British Forces in three weeks. To fully understand the success the Germans won between Sedan and Dunkirk, one must consider interwar years from 1919-1939. Following the lessons learned in WWI, German visionaries including Erich von Manstein and Heinz Guderian conceptualized new formations with massed tanks and motorized infantry to change the pace and tempo of battle. The German Army first employed their new Panzer divisions in Poland in 1939, and while the panzers dominated tactically, mechanized maneuver was not yet operationally decisive.

France and Britain's declaration of war on Germany after the seizure of Poland set the conditions for the miracle at Sedan, because an outnumbered German military had to conjure a maneuver magic trick to win. This magic trick was named operation "Sickle-Cut," a plan created by Manstein to sneak an armored group through the Ardennes, cross the Meuse River at Sedan to penetrate, and conduct a mechanized drive to the English Channel to split British and French forces.[15] Seeing few options that would bring about German victory, the German General Staff adopted the Sickle-Cut plan, which required massed tanks and motorized infantry formations that could maneuver independently at matched speeds much faster than their Allied enemies.[16] The Germans concentrated armor and motorized infantry into Panzer Group Von Kleist, which included about 50% of Germany's total tanks and motorized forces.[17] The 19th Panzer Corps, led by Heinz Guderian, was to spearhead the attack for Panzer Group Kleist and was the first formation of its type in history, purpose built to allow armor to seek operational success independent from its parent infantry army groups.

As a point of interest, most of the German generalship stood in opposition to the creation of Panzer Group Kleist because each army commander wanted their own panzer division. It was only through the Fuhrer's personal intervention that the revolutionary panzer group was created.[18] On the al-

lied side, the French and British spread their numerically and qualitatively superior tanks across their entire front.[19] When confronted by the massed armor and motorized infantry of Panzer Group Kleist, dispersed Allied tank formations and foot-marching infantry could not keep pace. Allied forces constantly surrendered initiative to the Germans and were always playing catch- up. The Germans had trained and rehearsed armored and motorized maneuver at the operational level (division/corps/group) while the Allies maneuvered separate tank battalions in support of foot marching infantry divisions (similar to how US helicopters are applied today). Massed German tanks and motorized infantry won the day using mobility as a psychological weapon to defeat allied forces by continually seizing positions of advantage first. Following the German victory, allied forces mimicked German force structure and massed their tanks and motorized forces throughout the rest of WWII. The legacy of the German success in 1940 continues today, proven by the continued existence of US Army armored divisions. As one might guess, the evolution of maneuver warfare did not stop with mechanized forces. Mass-production of helicopters after 1950 enabled another increase in the pace and tempo of maneuver warfare through air mobility.

Mass-production of helicopters after 1950 enabled another increase in the pace and tempo of maneuver warfare through air mobility

The inspiration for large-scale American air-mobile units was born out of WWII airborne experiences, applied through the lens of potential nuclear battlefields, and realized through the Pentomic Division concept. Major General (MG) James M. Gavin, an airborne pioneer, perceived the need for ground force dispersion to counter nuclear attacks with an additional requirement to concentrate quickly for counter-attacks.[20] MG Gavin's helicopter-borne "sky-cavalry" became a potential solution for the vulnerabilities and obstacles presented by nuclear warfare. To investigate the viability of air mobility, Department of Defense conducted successive studies including the Rogers Board and the Howze Board in 1960 and 1962 respectively.[21] The recommendations and exercises resulting from these studies were integral to creating air-mobile force structure, eventually spawning the 1st Air Cavalry Division in 1965.[22]

The 1st Air Cavalry Division was a revolutionary unit which included a unique mix of infantry, artillery, and helicopters in a formation fielding 434 aircraft, where the entire division moved at matched air-mobile speeds.[23] In 1968 the US Army added a second air-mobile division, the 101st Cavalry Division (air-mobile).[24] The simultaneous existence of two air-mobile divisions during Vietnam represented the apex of air mobility in US Army history and enabled tactical dominance in Vietnam through maneuver superiority. The tactical dominance of air-mobile units in Vietnam was demonstrated by a 313-day study conducted by the 9th Infantry Division (ID) in 1968. The study found brigade echelons without helicopter support averaged one significant enemy contact every five days resulting in 1.6 enemy kills, but when the same brigade possessed an air cavalry troop and an assault helicopter company, the number of significant enemy contacts increased to every other day and resulted in 13.6 enemy kills per day.[25] The success afforded to discrete brigades in Vietnam is easily scalable to operational levels. In Vietnam, political constraints and poor strategy limited the operational and strategic employment of air-mobile formations and helicopters were not afforded the opportunity to truly prove themselves. Faced with resource challenges and changing threats after Vietnam, air mobility fell from favor in the US Army, marked by the transition of 1st Air Cavalry Division to an armored formation in 1975.

Fast forward to 1991, and one witnesses a defining moment for operational air mobility. During Operation Desert Storm, the 101st Airborne Division conducted a series of successive brigade level air assaults from 24 February to 27 February 1991 to cut off the Iraqi Army's retreat from Kuwait.[26] These large-scale air assault operations proved air-mobile forces could achieve operational effects by enabling the dislocation and defeat of the Iraqi Army in less than 4 days. The US Army maintained the 101st Airborne Division's air-mobile force structure until 2014, after which, the 101st Airborne Division (air-mobile) became a shadow of its former self. Of the originally assigned 400+ helicopters, the division shrank to 113 rotary wing aircraft, with the difference dispersed to the Army's 12 other evenly distributed CABs. Just like spreading peanut butter, every division got an

equal taste of helicopters. By eliminating air-mobile divisions, the US Army gave up its ability to conduct operational maneuver at air-mobile speeds. To understand why the US Army dispersed its helicopters, one must examine America's recent wars in Afghanistan and Iraq.

AIR MOBILITY LIMITS: IS AVIATION ORGANIZED TO FEEL WITH FINGERS?

The current US Army aviation force structure and distribution was born during America's recent 20 years of stability and counter-insurgency experience. The even spread of 12 modular CABs was needed for continuous stability operations, enabling tactical superiority over insurgent enemies while ensuring aviation forces capable of continuous deployments. Spreading CABs was useful during stability operations, but distributing helicopters evenly hinders effective training for and execution of operationally decisive air-mobile operations. Effective air-mobile maneuver in large- scale combat requires habitual/assigned command and support relationships. To witness what happens when helicopters and ground forces do not operate habitually, one need only visit the US Army's Combat Training Centers (CTCs). Brigade level CTC training rotations usually pair ground brigades with ad-hoc aviation task forces (TF) consisting of 15-30 helicopters. The lack of habitual relationships and existing standard operating procedures makes effective integration of aviation forces into ground schemes of maneuver difficult. Symptomatically, Army units rarely conduct air assaults above battalion echelons. The current small-scale application of air mobility cannot realize the full potential of operationally decisive "vertical envelopment". Without brigades and divisions organized for large-scale air assault, our ability to make operationally decisive air-mobile maneuvers on the 200 MPH battlefield is limited.[27]

> Effective air-mobile maneuver in large-scale combat requires habitual/assigned command and support relationships.

To better overcome modern battlefield challenges, the US Army should take cues from the current organization of armored divisions and arrange our aviation forces in a similar fashion. We must ponder why American forces possess armored brigades, yet we do not have air-mobile brigades? We currently mass armor into ABCTs and heavy divisions (1 AD and 1 CAV) aligned under a single corps (III Corps). If tanks and mechanized forces work best when massed into brigades and divisions, then it follows that helicopters should mass as well.

As demonstrated by the historical cases presented, experience shows clear advantage to armies who mass mechanized and air-mobile forces. Just like tanks, helicopters are significantly more effective when massed and applied in conjunction with organic infantry where everything moves at the same speed. The best remedy to address the US Army's current lack of operationally decisive air-mobile capability would be to create a AMBCTs and associated higher echelon force structures.

AIR-MOBILE FORCE STRUCTURE SUGGESTIONS

What should an AMBCT and its associated division force structure look like? The examples set by the air-mobile divisions of the 1960s and 1990s, where each division had 400+ helicopters and the ability to move entire brigades in a single lift are worth examining.[28] Also, beginning with the assumption that modularity in CABs is valuable, then we should mass half of existing CABs into two air-mobile divisions aligned under a single Corps.

Regarding specifics, a way for air-mobile division structure would include two AMBCTs and one airborne Infantry Brigade Combat Team (IBCT). Each of the two AMBCTs pairs with an assigned CAB. The remaining CAB would serve as a divisional asset focused on air-mobile sustainment, division command and control transport, or movement of the airborne IBCT. The IBCT should retain airborne qualifications and would focus capability on operational maneuver into the deep area using Air Force aircraft.

AMBCT infantry combat power should be smaller than a regular IBCT with less artillery and engineers, similar to the smaller number of infantry assigned to an ABCT. The AMBCT's lack of artillery would be offset by the increased number of attack helicopters organic to its assigned CAB. Additionally, with 48 attack helicopters and 24 Tactical Unmanned Aircraft Systems (TUAS) per AMBCT, rotary wing firepower would enable independent maneuver by

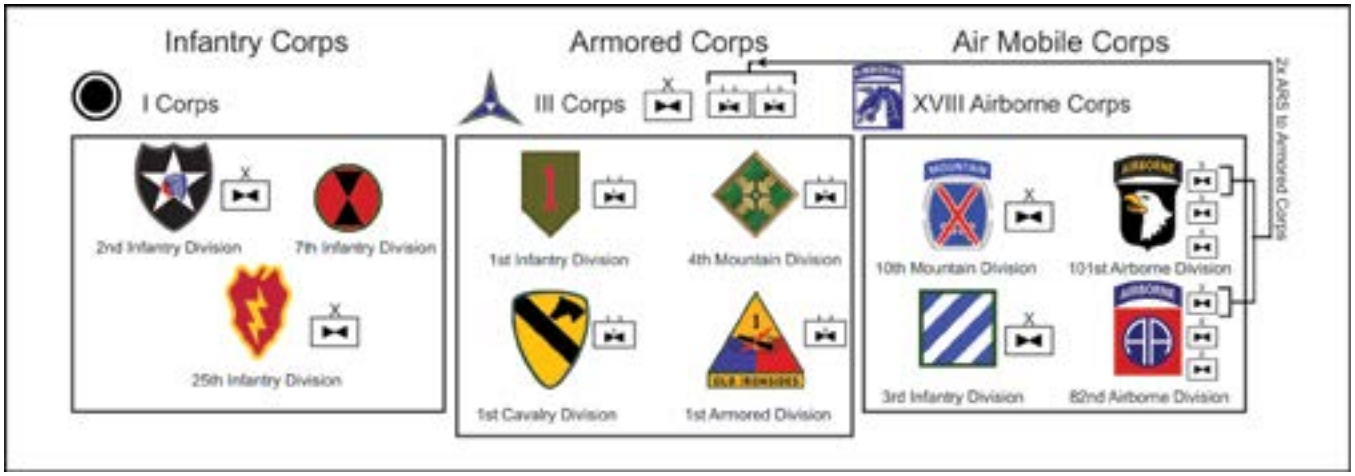

Figure 2. Suggested Corps airmobile force structure.

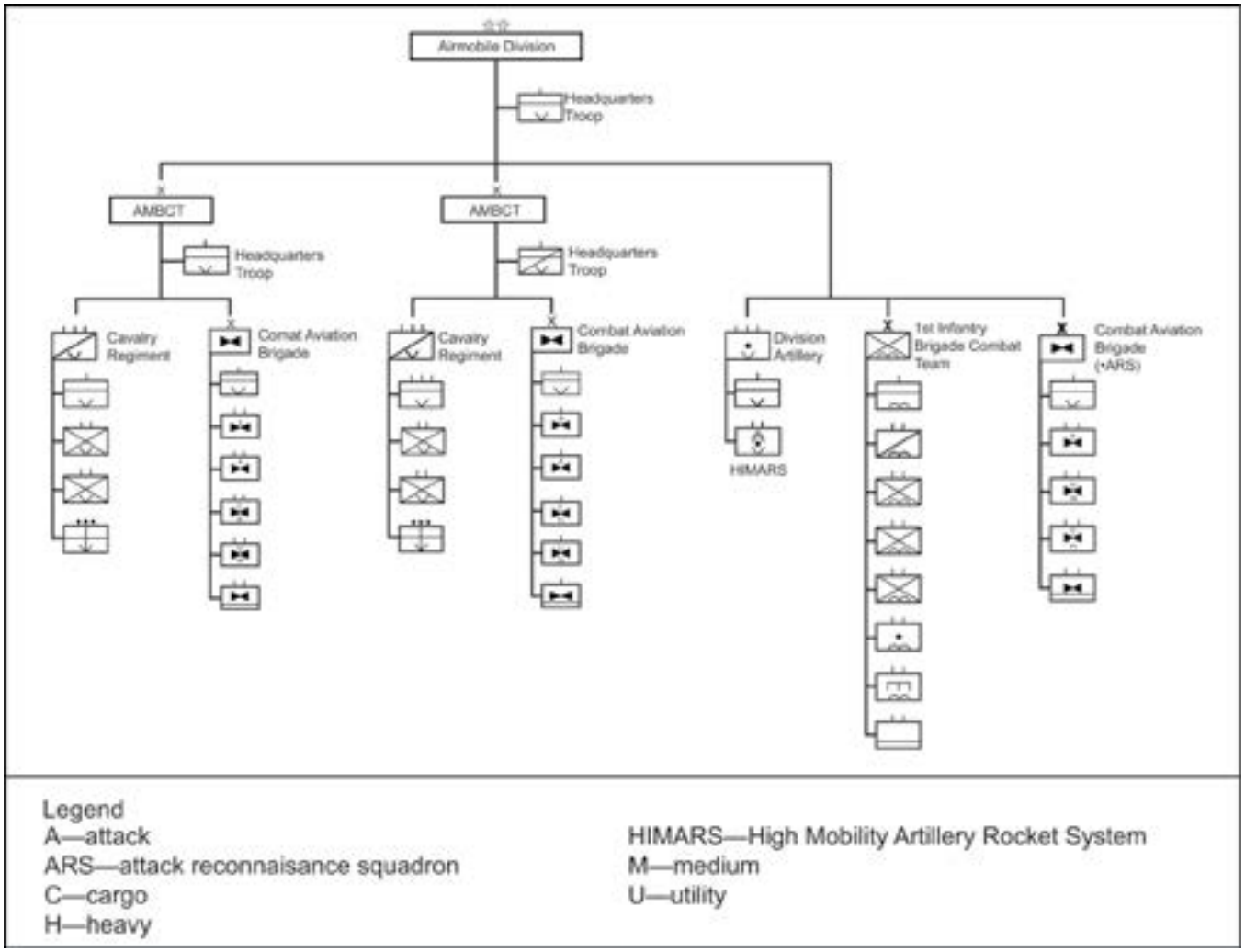

Figure 3. Suggested Airmobile Division and AMBCT structures.

finding and destroying enemies autonomously, providing an integrated direct/indirect fire capability to offset the lack of artillery similar to aerial rocket artillery during Vietnam.[29] The AMBCT engineer component should also have capabilities similar to the Air Force Red Horse squadrons to build heli-ports. Additionally, in order to maintain the mobility required to effectively cross the modern day "no-man's land", CABs must acquire organic specialty capabilities including EW (think EH-60 or EH-64), SEAD (Army HARM/Spike equivalent), and helicopter-borne precision logistics support (CH borne containerized SSA).

CHANGING SPEED LIMITS AND SAYING NO TO PEANUT BUTTER

The US Army of 2021 has enough aircraft, if massed, to outpace any peer- competitor by an order of magnitude. Creation of AMBCTs, with associated organization, equipment, and training would make a capable air-mobile force able to conduct independent maneuver at 200 MPH. Further alignment of AMBCTs into air-mobile divisions and a corps would assure operational air mobility advantages, enabling US land forces to gain physical, temporal, and cognitive advantages by using mobility as a weapon. Spreading aviation thin like peanut butter will not achieve the same decisive effects in large scale combat. Even considering recent efforts to re-equip the 101st airborne division with a heavy lift battalion of CH-47s, the air mobility gains do not accrue to operational level gains. If we continue to apply air mobility at small scale, without habitual command, support, and training relationships, we will ensure our land forces move at the same speed as everyone else. Compared to peer competitors, few have the requisite helicopters or organizational flexibility required for operational air-mobile power projection, and we can and should take advantage of enemy shortfalls. If the US Army creates AMBCTs and rebuilds two or more air-mobile divisions, we would ensure our land domain maneuver superiority for the foreseeable future.

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ENSURING STABILITY IN NORTH AMERICA AND THE EURO-ATLANTIC REGION THROUGH NATO'S WARFARE DEVELOPMENT AGENDA

By CAPT Mathew Molmer, USN; Lt. Col Jeff Barker, USAF; LTC Andrew Brown, USA; Lt Col Thomas Joyner, USAF

The 2021 US National Security Strategy, 2020 National Defense Strategy, and 2018 National Military Strategy identify 'Strengthening Alliances and Partnerships' as vital to meeting national and military strategic objectives. As events unfold in Ukraine demonstrate, this strengthening of alliances and partnerships is just as important today (if not more) than in recent history. To further these efforts, the former Chairman of the Joint Chiefs, General Dunford, brought to the NATO Military Committee the need for NATO to develop a future concept on warfare development for the Alliance.[1] Like the US Capstone Concept for Joint Operations: Joint Force 2020 (CCJO), this recommendation was later adopted by NATO and became the NATO Warfighting Capstone Concept (NWCC), which looks forward to guiding force development towards an Allied Joint Force in 2040. This new NATO concept directly aligns with the US Chairman of the Joint Chief's (CJCS) primary functions of *providing strategic direction for the armed forces* and *advising on global military integration*, thereby sustaining and advancing US Global Leadership by strengthening Allies and Partners to meet priorities for 21st Century Defense.[2] To help further clarify the connection between the NWCC and CJCS, Major General Tony Wright stated the NWCC would help support and further global military integration efforts.[3]

Currently, the US and NATO are both in a state of transformation to develop better deterrent capabilities and, if required, defeat an adversarial attack on the Alliance. To these ends, the NWCC, through NATO's Warfare Development Agenda (WDA), aims to focus the Alliance's strategic way forward by starting with an initial ten Lines of Delivery (LoDs) or transformation efforts. However, a connection between NATO and the US on where the US can help lead in these efforts is yet to be defined. This paper proposes a recommendation towards two suitable LoDs the US could lead on behalf of the

Figure 1. NATO's North Star and Warfighting Capstone Concept (2020).[4]

Alliance while also providing recommendations towards governance on what it means to lead an LoD. Additionally, this paper aims to highlight how these two NATO LoDs, Multi-Domain Escalation Management (MDEM) and Long-Term Military Strategic Shaping (LTMSS), are complementary to each other and would best align with US strategic objectives and enhance deterrence, and prepare allies and partners to prevail in any conflict.

... some Allies expressed concerns that China was also becoming a significant challenge within the strategic environment.

HISTORY OF THE NWCC AND WDA CONCEPTS

NATO's Allied Chiefs of Defense (CHODs) signed a new Military Strategy in May 2019 recognizing the strategic competition and instability stemming from Russia and terrorism. Additionally, some Allies expressed concerns that China was also becoming a significant challenge within the strategic environment. To implement the new Military Strategy, NATO agreed in 2021 on a Concept for the Deterrence and Defense of the Euro-Atlantic Area (DDA) from a 360-degree approach.[5] The DDA concept is a single, coherent framework to contest, deter, and defend against the Alliance's main threats in a multi-domain environment.[6] It broadens the concept of deterrence in the direction of contesting hostile acts rather than entirely preventing them. The NWCC envisioned the complex nature of modern warfare as a contest where deterrence must demonstrate an apparent ability to defend, and what this defense is based on, controlling multiple domains of warfare simultaneously.[7]

Additionally, to further operationalize NATO's Military Strategy, NATO introduced its NWCC, which outlined a longer-term vision for the Alliance's warfare development (see Figure 1). The NWCC provides the Alliance and Allies with a 'North Star' and organizing principles for warfare development for the next 20 years.[8] It focuses on building advantage and 'pulling forward' the most critical ongoing work towards an ambitious view of a future military instrument of power. Furthermore, Rear Admiral John W. Tammen asserts that the NWCC maps out a path for Allies to focus, synchronize, and cohere efforts, stating that the Alliance is poised to stay ahead of the competition in an increasingly fluid, connected, and complex global security environment.[9]

The NATO Military Strategy and its two implementing concepts, the NWCC and DDA, set a new baseline for NATO's military-strategic advice on the employment and development of the Alliance's military instrument of power. It forms a road map for NATO and for Allies to focus, cohere, and synchronize efforts. The NWCC identifies five Warfare Development Imperatives to ensure NATO's success in future warfare: cognitive superiority, cross-domain command, influence and power projection, integrated multi-domain defense, and layered resilience.[10] The NWCC and its implementation through the WDA aim to establish a framework organization for the changing character of warfare. According to The Hague Centre for Strategic Studies, to achieve these imperatives, the NWCC recommends the development of key enablers, such as the *right people with the right skills* as well as those technologies that can have a game-changing impact and master big data and advanced analytics.[11] The WDA puts these enablers into the context of emerging and disruptive technologies, adversary asymmetry, and how the art of projecting power is no longer about generating mass. By taking this approach, the WDA operationalizes the five NWCC imperatives through LoDs and spreads them out over the next 20 years.

LINES OF DEVELOPMENT (LOD) DISCUSSION

LoD 1: Multi-Domain Escalation Management (MDEM)

The first LoD in which the US should lead transformation efforts is MDEM. What exactly defines MDEM? According to Dr. Michelle Black, MDEM is a Whole of Government (WoG) approach to synchronize, resolve, and or deescalate tensions at the strategic level.[12] Stated differently, MDEM is shaping up to be what the US would view as the Diplomatic, Informational, Military and Economic (DIME) approach to using various instruments of power. This approach is supported by Cross-Domain Military "M" operations commonly known as land, air, sea, space, and cyberspace warfighting domains. MDEM involves the mixing and merging of military and civilian action.[13] Looking at the current situation in Ukraine, the concept of MDEM is informally being applied by

the US, EU (European Union), NATO, and the international community. However, if the US would take the lead in the formal development and implementation of MDEM for NATO, the US would ensure the Alliance is more capable of coordinated efforts while supporting US strategic objectives within the region.

The ultimate purpose behind MDEM is to prevail in a situation while deterring one or more hostile actors by using all necessary systems to exploit and achieve freedom of maneuverer within a conflict to achieve strategic objectives and return to the preferred status quo.[14] Based upon the WoG nature of MDEM, these efforts need to achieve a "strategic rather than tactical objective" aimed to deter or defeat hostile actors during an armed/non-armed conflict or competition. "By including multiple domains and their capabilities – lethal and nonlethal, the warfighting space can include many possibilities."[15] Opponents to the US leading efforts for NATO's MDEM concept might point to wanting a more EU or even national focus. However, this narrow view of the concept would diminish utilitarian benefits that the Alliance would receive from a broader perspective and wider coordination. To scope this paper, the MDEM efforts discussed will focus on the military options the US could lead (realizing that MDEM can expand to WoG), both from an operational design and integration point of view (see Figure 2).

The US military is currently working towards better integrating the Joint Force across the domains of Air, Land, Sea, Cyber, and Space. The DOD addressed gaps in Joint integration in space and cyber by establishing the US Space Force and Cyber Command to achieve these ends. Now that the US has established and delineated leads across the military cross-domain spectrum, these services could be leveraged to aid NATO's military cross-domain integration of MDEM. Moreover, by focusing on cross-domain integration with the Alliance, the US military would ensure our national planning efforts complement those of NATO. This integration of capabilities will continue to grow as we look towards the future fight against adversaries in an era of global competition. Furthermore, the US has the most experience and understanding for escalation management across the nuclear enterprise that would ultimately underpin any NATO multi-domain escala-

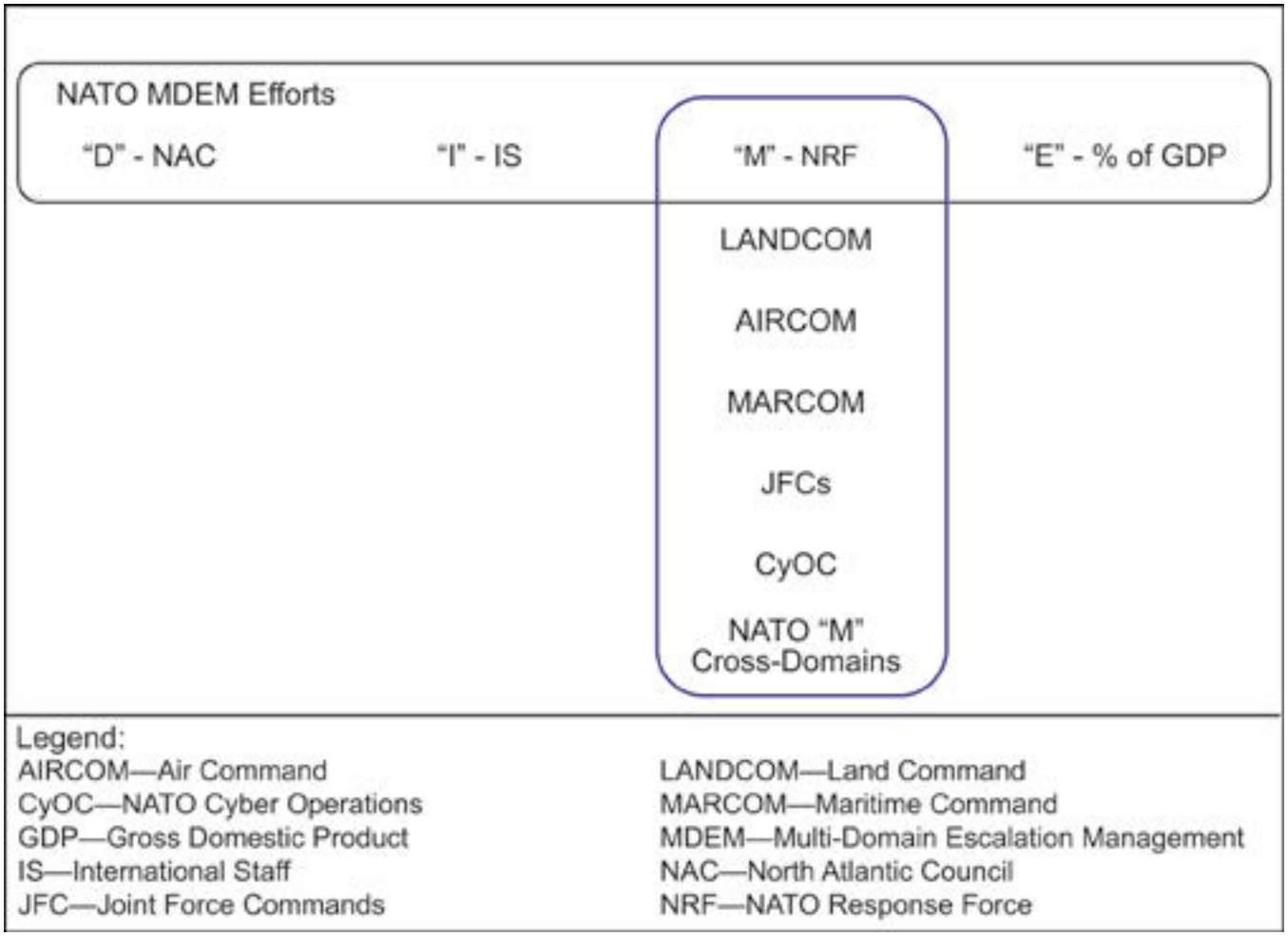

Figure 2. DIME (MDEM) NATO Design.

tion management. Therefore, it befits the US military to act now and lead the cross-domain integration efforts, which are an inherent part of MDEM, for both the US and NATO to ensure the Alliance remains the deterring force in Europe.

LoD 2: Long Term Military Strategic Shaping (LTMSS)

The second LoD in which the US should lead transformation efforts is LTMSS. LTMSS should be viewed as a complementary concept to MDEM. The purpose of LTMSS is to go beyond established planning processes and consider potential strategic effects and identify, illuminate, and analyze elements of uncertainty and future alternatives that have not before been part of the equation. LTMSS is not designed to predict the future or solve its uncertainty but rather to define a range of possibilities that consider all possible strategic effects. By utilizing NATO's established planning processes, analysis, and strategic influences, LTMSS compliments these processes and produces more comprehensive advice for political and military leaders. Another way to think about LTMSS is to look at it as a WoG holistic process that supports military and political decision-making by shaping the future operational environment (OE) and presenting multiple dilemmas for adversaries.

... a WoG holistic process that supports military and political decision-making by shaping the future operational environment (OE) and presenting multiple dilemmas for adversaries.

The US should consider LTMSS in the Joint Strategic Planning System (JSPS) context. LTMSS presents an opportunity for the US to expand and link its continuum of strategic planning direction on force development and design to NATO through this LoD. NATO's LTMSS concept is similar to the CJCS's statutory responsibilities to keep a global perspective and develop military advice (i.e., Chairman's Risk Assessment, Joint Military Net Assessment, Capability Gap Assessment) for civilian leadership. From a NATO perspective, the new CHODs Risk Assessment, Net Assessment LoD, and the NATO Defense Planning Process serve nearly identical purposes of informing military and political bodies across the Alliance and partner nations to shape future policy decisions that maximize deterrence to any adversary. Furthermore, benefits from US leadership on LTMSS could, by the end of the projected LoD timeline, positively shape and develop both allied and partner capabilities, thereby reducing Joint, Allied, and Partner risks to various campaign plans and or regional conflict. By using Ukraine as an example, developing a concept like LTMSS could have aided senior leaders throughout the Alliance to recognize better, prepare, coordinate, and execute a comprehensive, unified plan that may have deterred Russia from ever entering Ukraine.

RECOMMENDATIONS FOR THE NATO WARFIGHTING CAPSTONE CONCEPT (NWCC) AND WARFARE DEVELOPMENT AGENDA (WDA)

Key aspects must still be defined for the NWCC and WDA concepts to succeed. For example, what does it mean for a nation to have *lead* LoD development responsibilities, where should the LoD development requirement reside within NATO, and how can lead nations source these LoD development teams within NATO?

Regarding NWCC and WDA, the term lead needs to be clearly understood within NATO. Utilizing existing concepts in NATO, the best way to describe a LoD lead is to frame it in the context of *Coordinating Authority* (CA), as described by DDA. In DDA, CA is designated to a Joint Force Command (JFC) at the operational level within NATO to ensure synchronization, deconfliction, and coordination within their designated Joint Deterrence Area (JDA) or a Joint Task Force. CA enables a JFC to have Operational Control (OPCON) over the mission while delineating subordinate commands tactical control (TACON) for the operation. In the NWCC and WDA concept and implementation, the same construct for CA would be applicable and the term is understood within NATO. The key takeaway is that NATO Allied Command Transformation (ACT) would retain OPCON over the NWCC and WDA process, but the "lead" nation that volunteers for an LoD would be assigned CA for the research, development, and implementation plan for that LoD.

The next issue is where within the NATO Command Structure (NCS) should this lead nation implementation reside? Based upon the organizational structures of NATO and access required through-

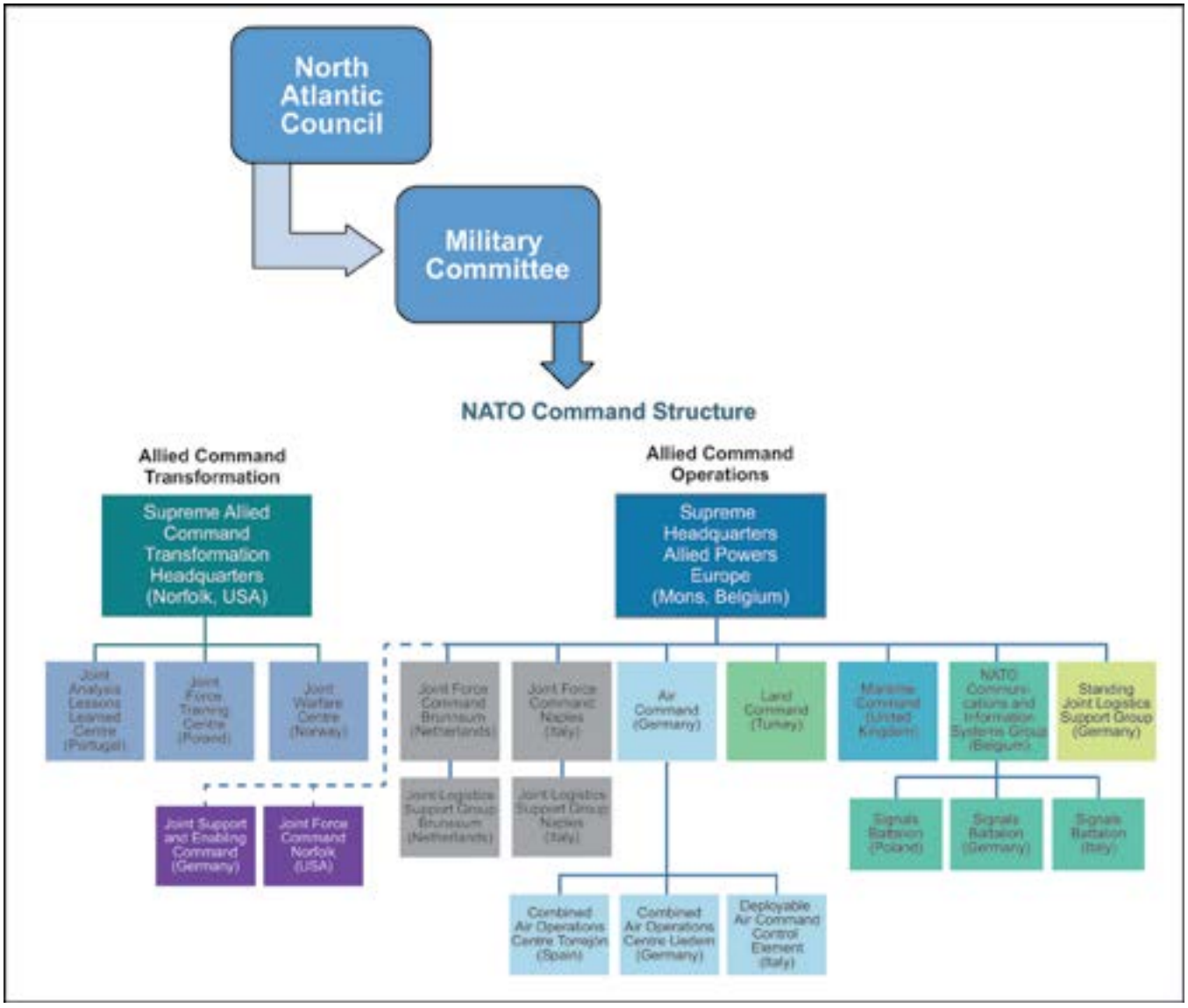

Figure 3. NATO Command Structure.

out the development of a LoD, the team should not reside just within their nation. Team leads should be embedded within the NCS to ensure accessibility to NATO leadership for guidance and direction throughout the development and implementation of their LoD. Also, NATO Allied Command Operation's JFCs are focused on current operations within their assigned JDAs and are not staffed to take on strategic projects. Therefore, Allied Command Transformation (ACT) is the most logical organization within the NCS where these efforts should reside.

The third piece that needs immediate attention for LoD development is how the leadership team is sourced. Assigning human resources within NATO is approved through the North Atlantic Council and reflected in what is known as the Peacetime Establishment (PE) postings. The challenge here is the NWCC and WDA are new concepts requiring an additional workforce, but the PE process is a multi-year endeavor that could take over five years for approval. Therefore, when a nation decides they want to volunteer to lead an LoD, the three solutions from within the NATO human resource structure available are contractors, Voluntary National Contributions (VNCs), or a combination of the two. As a result, as nations assess LoDs, it is vital that they account for the additional appropriate skilled workforce (which is likely going to come from their own nation's VNCs).

A final vignette for the future of the NWCC and WDA is that ACT must develop a "red team" to ask the question of "What are we missing" and assess the development of the LoDs to ensure they still are relevant. This is an absolute requirement because of the lengthy LoD timelines (some LoDs are not planned to be fully operational until 2040). As a result, this requires a team to challenge assumptions,

identify new and emerging LoDs continuously, and critically assess gaps in what is being developed compared to the future challenges NATO will face.

CONCLUSION

While both the US military and NATO are at a critical point in their history, they are both looking for opportunities to integrate across multiple domains to achieve strategic, operational, and tactical advantages while simultaneously creating dilemmas for an adversary. Based upon achieving mutual benefits and the DOD's existing processes, expertise, combined with organizational structures, the US military should volunteer to lead NATO's LoDs of MDEM and LTMSS. These two complementary LoDs are directly tied to ensuring the Alliance's strength as a deterrence force in the future and support the US's strategic objectives of regional stability by countering Russia and China's aggression and destabilizing effects of terrorism.

Whether taken from the historical perspective of World Wars or the current situation in Ukraine, there is a clear reason *why* NATO needs to deliver on the concepts of MDEM and LTMSS. By taking these proactive steps now, NATO (and the US) will be in a greater position of power should deterrence fail and future conflicts arise. Perhaps if NATO had these concepts in place across the Alliance today, Ukraine and the region would have been better prepared. Additionally, through these efforts, NATO may have had the tools needed to de-escalate the unfolding crisis before it resulted in a full-out invasion. Future Alliance integration and transformation efforts will require a significant commitment for NATO. However, the US can work to ensure connectivity and interoperability across the NATO Alliance and DOD. Furthermore, US expertise in escalation management and proven processes would significantly shape the strategic future of NATO, creating new research and improved capabilities. As a member of NATO, the US should take the lead in these transformation efforts within NATO to ensure both the US and the Alliance remains a significant deterrence force in the Euro-Atlantic region.

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FORTIOR SIMUL – STRONGER TOGETHER: CHINA'S EXPANSIONIST AND BELLIGERENT ACTIONS REQUIRE AN ASIAN SECURITY PACT AKIN TO EUROPE'S NATO

By Major Mark D. Natale, USA; Lt. Col. Scott Zarbo, USAF; LCDR Christian Buensuceso, USN; CDR Price Balderson, USN

ABSTRACT

Problem Statement: China's vice-like actions to expand its sphere of influence require an Asian security pact modeled after Europe's North Atlantic Treaty Organization (NATO). For years, China has been engaging in malicious activities in the INDOPACOM AOR to disrupt the West and establish regional dominance in Asia.

China is systematically isolating and exploiting minor countries in the region through economic influence, the "One-Belt, One Road" initiative, FONO (Freedom of Navigation and Overflight) denial, territorial waters and island disputes, and active space and cyberspace campaign. Why is this occurring, and what can stop it? The minor countries in the AOR cannot oppose the Chinese as individual nations; therefore, they must establish a robust security pact, like Europe's NATO.

Research Question: Would an Asian-Pacific security pact organization, similar to NATO, successfully counter China? Much the same way that NATO has in deterring Russian aggression in Europe? If so, why has this security pact not yet been established? And should the United States invest in such an organization as a way to synchronize and orchestrate coordinated counter-activities against Beijing?

Anticipated Statement of Finding: A robust, capable, and determined security pact in Asia would successfully counter most, if not all, of China's aggressive activities in the region. Based on China's foreign policy perspective and their desire for preeminence on the world stage, it would stand to reason that China would not only desire to participate in such an organization but would aim to control it. Including key members like the US, Australia, Korea, and Japan as permanent members, while providing invitations to contested countries and territories like Taiwan, Hong Kong, India, Tibet, and others would create a "Chain-of-Partnership" surrounding China.

Further analysis would compare how NATO successfully countered Russia in some instances and further demonstrate how this model could apply to Asia would support our initial theory and findings. Additional research would indicate that any current pact in Asia (such as ASEAN) is insufficient because it does not involve all relevant parties and focuses more on economic trade issues rather than military partnership and security.

Methods: The methods employed to analyze the proposed problem statement will be theoretical research and comparative analysis. Specifically, NATO's success and failures of countering Russia in Europe will be examined and applied to a proposed, similar organization in the Pacific. This paper aims to identify the framework/concept to address the problem and answer the research question of China's aggression in INDOPACOM and support the thesis that a "NATO-Like" organization in the region would have better success. This methodology of comparing the situation to NATO and then applying it to an alternate potential future outcome will show the value and utility of such a pact. The process will weave through the following proposed outline: 1. The analogy of the Bundle of Sticks; 2. Describe the O.E.; 3. Describe the Chinese threat; 4. Proposed Recommendation; 5. Conclusion Vignette.

I: STRONGER TOGETHER: LESSONS WE CAN GLEAN FROM HISTORY

Before his death in 564 BCE, the ancient fabulist and storyteller, Æsop, told a story of a father and his petulant sons. The fable, commonly referred to as The Bundle of Sticks or The Old Man and his Sons, describes the man's last interaction with his sons before his death. The message he had for his individualistic and combative children was that there

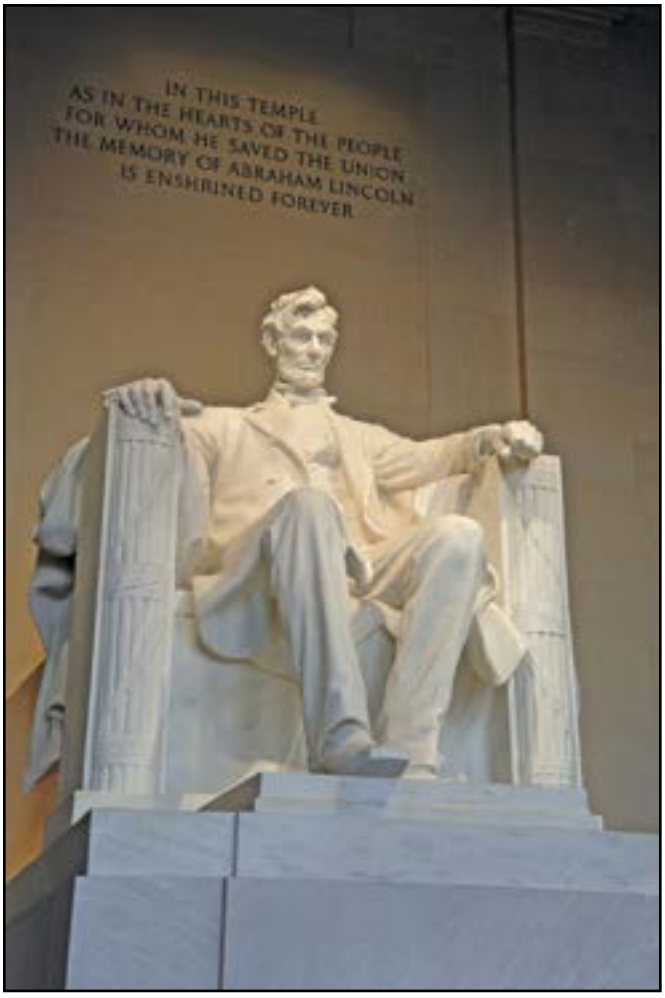
is "Unity in Strength." An excerpt from this fable demonstrates the immense power and strength that individuals have as a cohesive group:

> *An old man had a set of quarrelsome sons, always fighting with one another. On the point of death, he summoned his sons around him to give them some parting advice. He ordered his servants to bring in a bundle of sticks wrapped together. To his eldest son, he commanded, "Break it." The son strained and strained, but with all his efforts was unable to break the bundle. Each son in turn tried, but none of them was successful. "Untie the bundle," said the father, "and each of you take a stick." When they had done so, he called out to them: "Now, break," and each stick was easily broken. "You see my meaning," said their father. "Individually, you can easily be conquered, but together, you are invincible. Union gives strength.*[1]

This fable is so profound and timeless that it has been adapted, retold, and incorporated in countless mediums to express the point of strength in unity. This concept has been demonstrated throughout history and most recently highlighted as the motto of the Special Operations Joint Task Force – Afghanistan (SOJTF-A), "Fortior Simul Quam Seorsum," translated from Latin, means: "Stronger Together Than Apart." The symbolism of the bundle of sticks, also known as Roman fasces, also adorns the Lincoln Memorial to depict the President's desire to maintain the Union. See Figure 1. These fasces represent the states — and the American motto "E Pluribus Unum," or "Out of Many, One," — the rods bound together suggest the union of the states and their bond with the Constitution. Each state is weaker individually, but together, they are stronger.[2]

This analogy perfectly describes the current environment in Asia-Pacific. It highlights the troublesome fact that if the nations of Asia do not bond together, they will be unable to counter China's aggression in the region and will be susceptible to their political, military, and economic dominance for countless future generations.

Thus, the resulting question is how can a group of radically different countries, cultures, economies, and people unite to combat China? This paper proposes an innovative and potentially controversial solution: Asia needs a security organization



A photo of the Lincoln Memorial taken during the 56th Presidential Inauguration Ceremony, in Washington, D.C., 21 January 2009. (Photo by Staff Sgt. John Hughel)

modeled after NATO and focused on the defense of the region through military power. The concept may not sound controversial at the onset. However, the unique difference is that key Asian countries, such as S. Korea, Japan, and India, must lead this organization, whilst including diverse and inflammatory partners like Tibet, Nepal, Taiwan, Singapore, Australia, and the United States as partial, associate members. The aim is to expressly exclude China from exploiting the weaker members of the region and provide an organization that can leverage existing agreements.

This organization would create a similar structure that we saw in a post-war Europe, applied to contemporary Asia. The proposed model would be designed around a NATO archetypal and leverage the power of Article V of their charter, which states that "an attack on one, is an attack on all." Although NATO has not been in a direct kinetic conflict with Russia, and some analysts say NATO would be unable to defend Europe fully from a full-scale Russian invasion, it is abundantly clear that NATO's mere exis-

tence has acted as a sufficient deterrent from Russian aggression for its member nations for decades. Asia needs a similar structure: a robust barrier against Chinese expansion and military demonstration backed by a steadfast commitment to mutual defense and cooperation.

II: ASIA-PACIFIC: DIVERSE COUNTRIES WHICH MAKE A COMPLEX WHOLE

The 36 nations comprising the Asia-Pacific region are home to more than 50% of the world's population, 3,000 different languages, several of the world's largest militaries, and five nations allied with the US through mutual defense treaties: Australia, Japan, the Philippines, South Korea, and Thailand.[3]

In 2020, four Asian economies were among the top ten US trading partners: China (1), Japan (4), South Korea (6), and Taiwan (9).[4] Asia is also home to the United States' pacing-threat in economic size and military strength, China; the world's most populous democracy, India; and the world's most populous Muslim-majority nation and third most populous democracy, Indonesia. Asia includes five countries with nuclear weapons programs: China, Russia, India, Pakistan, and North Korea.

By 2028, many economists predict that China will overtake the United States to become the world's largest economy in Gross Domestic Product.[5]

The balance of economic power in the region continues to shift. In 2010, China overtook Japan to become the world's second-largest economic power. By 2028, many economists predict that China will overtake the United States to become the world's largest economy in Gross Domestic Product.[5] China will continue to assert itself both inside and outside the first island chain. Coupled with partner and ally concerns about the United States' capability to modernize, deter, and remain the region's predominant force, it is causing those allies and partners to change their strategic outlook. Over the past decade several Indo-Pacific nations have substantially increased defense spending to prepare for new challenges. They are seeking to develop new intra-Asian security partnerships and strengthen existing strategic relationships.

The US has lasting relationships with some of these pacific nations, including Japan, India, and Australia, termed "The Quad." This Quadrilateral Security Dialogue is a four-country coalition with a common platform of protecting freedom of navigation and promoting democratic values in the region. The group was initially formed after the 2004 earthquake in India, held meetings in 2007, but did not renew a considerable effort to counter China until 2017. The operational military focus of the Quad is demonstrated by the annual Malabar exercise, which all four nations participated in for the first time in 13 years in 2020.[6]

The other major pacific partnership is the Association of Southeast Asian Nations (ASEAN). It is a 10-member, multinational group with the stated goal of cooperation in the economic, social, cultural, technical, educational, and other fields, and in the promotion of regional peace and stability through abiding respect for justice and the rule of law and adherence to the principles of the United Nations Charter. ASEAN engages in a wide range of diplomatic, economic, and security discussions through hundreds of annual meetings and is primarily trade and security-focused, especially around one of the world's most critical sea lanes, the Strait of Malacca. The US, while committed to the ASEAN alliance and its outlook, is troubled by the fact that the member countries do not want to be forced to choose between the US and China during rising tensions, as their economic ties with both nations are strong and vital to their interests.[7]

Since World War II, the US has created bilateral relationships with multiple Asian countries, including South Korea and Japan, which have been under strain over the last four years due to the Trump administration's open questioning of the value of the relationship and their demands for burden-sharing of troop costs in those countries. The Biden administration has worked to repair those ties through a May 2021 summit, demonstrating unity and giving Japan and South Korea more autonomy and additional involvement in US regional strategy.[8] This showed the administration's move away from the "hub and spoke" model of the post WWII timeframe. The "hub and spoke" model consisted of several bilateral agreements between the US and Asian partners, but now the movement is toward a series of overlapping relationships, both economic and defense-focused.

The ultimate goal is to create a new structure to counter a rising China for the US and its Asian allies and partners. Multiple bilateral relationships simply cannot counter Chinese malign activity in the area since there is no unifying commitment to oppose China militarily, diplomatically, or economically, not due to political will but based on necessity due to China's rise as a regional and global superpower. Creating an Asia-Pacific security organization would counter China's free reign in the region and reinforce these existing agreements by giving "teeth" to these treaties.

III: TIGER IN THE JUNGLE: THE CHINESE THREAT IN THE REGION

On July 6, 2021, while at the World Political Parties Summit, China's President Xi said, "China will never seek hegemony, expansion, or sphere of influence." President Xi has often repeated this mantra in other forums and symposiums. However, in all aspects of Chinese national power, this is patently untrue. China is a military and security threat to the Indo-Pacific region and the overall world order.[9] Now more than ever, a multi-lateral military defense agreement with the nations of the Pacific region is required to halt the Chinese juggernaut, which is ready to unleash its military might if its diplomatic, informational, and economic means are thwarted. With its singular one-party system, China's approach is to militarily force its influence on each of its neighbors in the region.[10]

Now more than ever, a multi-lateral military defense agreement with the nations of the Pacific region is required to halt the Chinese juggernaut ...

China counters that everything they are doing in the region is "defensive in nature"[11] and that everything they are pursuing is "justified, reasonable, open, and transparent."[12] Even so, while China made this statement, it sent 28 military jets into Taiwan's air defense identification zone – its fifth incursion into Taiwan territory in June 2021.[13] The invasions take place periodically, and this was simply an instance of their authoritarianism and demonstration of power. However, for four straight days in the weekend of October 1, 2021, China sent nearly 150 warplanes into Taiwan's air defense identification zone, forcing Taiwan's fighter jets to scramble.[14] The volume and the type of planes used, including fighter jets, bombers, and anti-submarine planes, made Taiwan worry that they were under direct threat. These actions lend to a narrative that China, like a tiger in the jungle, stalking its prey, is preparing and inching closer to an invasion of Taiwan to fulfill President Xi's proclamation of the inevitable unification of Taiwan.[15]

The Taiwan issue is only one case of many territorial disputes in the overarching theme of the Chinese military threat. If this Asian Security pact were to succeed, then it must include Taiwan in some capacity. Simply ignoring the issue or not recognizing their political status plays to China's advantage. That is why they must be included as an associate member of this organization. Territorial disputes between Taiwan and China are just the beginning, there are multiple contentions on land and at sea between China and its neighbors. However, with its feigned diplomacy, the argument is always backed up by the might of the Chinese military. In its publicly available Defense Policy[16],China states that the "Chinese nation has always loved peace" and "respects the rights of all peoples to independently choose their own path." However, it is a strictly forbidden topic to consider the independence of Taiwan, Hong Kong, or Macau. Their Defense Policy also continues to speak adversely, when it declares that China will protect its territorial integrity for all of the "inalienable parts of the Chinese territory," where a proclamation follows that China will "build infrastructure and deploy necessary defensive capabilities" in these territories. This statement is more than just a proclamation of sovereignty. It is a direct notice to the countries and groups with territorial disputes with China and a blunt warning to the nations that do not support the Chinese version of peace in the world.

The Philippines, Vietnam, Malaysia, and Bhutan are just a few countries that have disputes with China, and most are unable to match the authoritarian threat. Japan, South Korea, and others have cautiously voiced their displeasure amid growing regional anti-Chinese sentiment. With China's 2021 military budget over $261B[17], ($52B more than India, Australia, Japan, and South Korea combined), the anger shown by the other countries is nothing more than words with no actual recourse. Realistically, India, as the only other established nuclear power disputing China's self-proclaimed boundaries can delay, but never actually block the Chinese threat.[18] China's

occupation of disputed areas in the Ladakh and the Arunchal Pradesh region is at its most serious[19], leading to the first lethal border clash between the two countries since 1975, which left 65 service members dead (20 Indian and 45 Chinese) on both sides.[20]

Aside from the Indian example, no other country in the Indo-Pacific region has directly and militarily confronted China's ground and maritime boundaries. From China's 9-Dash Line maritime claim and the Sri Lankan port grab at the tip of India, to the Socotra Rock south of South Korea and Gesur province of Bhutan, each of these countries in every single disputed territory stands no military chance against China. With an expected increase in military spending to $362B[21] in 2027, this is counter to China's Defense Policy where it states that China is opposed to "abuse of the weak by the strong, and any attempt to impose one's will on others."[22]

It is now more necessary than ever for the Indo-Pacific countries to create a "Chain-of-Partnership" to rebuff China's military advances. There is no denying that China's Defense Policy, purportedly written with a defensive stance, is genuinely a document lighting the path to transgression. Only with a security pact organization, similar to NATO, will the region successfully counter China's military threat. The focus of this organization should be to encircle China in a ring of security and leverage the strength of many nations.

China's expansionist ambitions in the Indo-Pacific region demand the establishment of an organization that has a defense focus.

IV: BUILDING AN ORGANIZATION ABLE TO RESPOND TO CHINA

China's expansionist ambitions in the Indo-Pacific region demand the establishment of an organization that has a defense focus. As the region's countries are vastly diverse in their size, culture, and capability, the formation of this organization will allow them to unite their resources and resolve to create a formidable opposition to China. The nations of the Indo-Pacific region have successfully combined to establish multiple organizations throughout the years to address pertinent issues affecting the collective. However, none are precisely focused on or capable of countering China militarily.

This new organization will be most effective with a construct and activity that mirrors NATO to deter China's encroachment into the South China Sea and beyond. NATO serves as the appropriate benchmark as it was formed to aggregate the collective resources of Western nations to halt Russia's expansion of territory and influence across Europe. China's similar expansionist ideals, propelled by its size and strength, are the problem faced in Asia today, much like Russia was last century. However, there exists one key difference with countering China that was not present when handling Russia. In the 1900s, the still fledgling global economy allowed seclusion of Russia, giving an economic advantage to the West. Today, with a more mature and intertwined global financial system, Asian nations cannot isolate China economically in response to its actions like the West could with Russia. Therefore, establishing a defense-focused organization like NATO is a necessity. Such an organization will create such a counterweight, providing peaceful, economic, and diplomatic engagements with a unified show of strength amongst the region's community that would work to contain Chinese aggressions.

The most significant benefit to the region of this new organization would be introducing a similar mutual defense commitment as NATO's Article V. Until this point, formal organizations in the area have maintained a policy of non-interference in other nations' affairs. The preference is the utilization of soft power to address their grievances. However, an Article V provision amongst an alliance would force China to factor in a large-scale military response by the region if one aggrieved nation were to enact it. Ongoing activities such as island seizure, intimidation of maritime forces, or invasion of Taiwan could all lead to a strong response propelled by a mutual defense agreement.

Although in this paper, the term NATO is used, it is only for comparison purposes. There is no intention for countering China in the Pacific to become a mission set under the current NATO charter. NATO does not have the capacity, desire or goal of committing to operations in Asia for this organization to be credible, it will have to comprise and be led by the countries in the Indo-Pacific region. Figure 2 depicts a proposed inaugural structure of this

organization. The critical aspect to the success of a defense-focused organization in the area will be its membership composition. One consideration for the arrangement, since the intent for this organization is to deter China, is that it cannot be an all-encompassing organization like the European Union. Only countries at risk or have the potential to be at risk by China should be members and inflammatory countries or nations with unclear political status should become associate members.

Indiscriminate participation is one current challenge organizations in the region face when attempting to address negative Chinese actions. ASEAN, for example, experiences this challenge when trying to denounce China's military aggression. Though formed to advance socio-economic issues primarily, ASEAN has tried to utilize its position to address China's negative behavior. To its detriment in this effort, the organization comprises multiple nations not distressed by China in situations such as the South China Sea disputes. Cambodia is a prime example of this problem. Despite not being impacted in an issue, Cambodia is still free to act and vote on ASEAN motions relating to China's threats. Sympathetic to China's claims, with intense Chinese economic pressure and working on their behalf, Cambodia has voted against any efforts deemed unfavorable to China in response to its actions against a member nation.[23] Though not a member of ASEAN itself, China can still manipulate the organization to its will by exploiting sympathetic member nations. For this reason, only affected countries should comprise the organization during its infancy.

Additionally, the countries in the region have proven very skilled at diplomacy to counter China. However, as China becomes brazen in its actions within the South China Sea and beyond, the region's actors will need a strong military backing to their soft power efforts. As a collective, this new defense organization will be formidable, but countering a Great Power will require a near-peer actor amongst its ranks. The United States comes to mind as most suitable for this task. This idea, however, provides as many problems as solutions. An example of the challenge to the inclusion of Western nations is demonstrated by the failed South East Asia Treaty Organization (SEATO). SEATO was established to counter the spread of communism in South East Asia, not unlike how this new organization would counter Chinese expansion.

Ultimately, SEATO proved unsuccessful with its inability to alter the outcome of the Vietnam conflict in favor of the West. Tagged with this failure, it subsequently dissolved. The demise of SEATO is continually cited as a deterrence to creating another defense alliance in Asia. However, a post-collapse SEATO examination has shown that one of its most substantial barriers to effectiveness was the dominating presence of the United States and other Western powers in place of countries from the region.[24] This

Figure 2: Notional member nations of a future "Asian" NATO.

mismatched organizational composition deterred recruitment and cost international credibility. SEATO's failure serves as the requirement for introducing an Asian-led organization to tackle the China dilemma vice the Western-led NATO in Europe.

Despite the United States having ample economic and military resources, there is hesitation by regional state actors to give the US a prominent role in the organization, and by default, the region's affairs. The solution to balance member nations' requirement for military power can be addressed by adopting a partnership-for-peace program modeled after NATO. NATO successfully utilized this program to allow the organization to incorporate and interoperate with countries without bestowing official membership. It also served as a grooming and vetting mechanism for potential members. The utilization of this program would allow the participation of the United States and other Western powers in the "Asian NATO" equivalent to provide a more substantial military backing to the diplomatic efforts by the countries in the region without the perception that they are dictating actions.

The initial establishment of the organization's membership composition should not be rushed to failure and this organization should learn of the mistakes of SEATO, ASEAN, and other precarious agreements. At its onset, there will be prominent member nations due to their conflicts with China. The partnership-for-peace program will allow Western powers and prospective countries to join without inducing turbulence within the organization. However, two potential member nations remain whose participation will need to careful thought for its cost-benefit. These nations are India and Taiwan.

The case could be made to include India in this new organization as this has been a consideration in the past. The presence of a solid Asian power would bolster the organization's credibility as it works to deny China its ambitions. However, up until the present, India has declined invitations to join any collective defense agreements. In two instances, they successfully lobbied other nations also not to join.[25] This scenario could prove to be a liability. India's lack of participation may prove not to be a negative factor. Absent a strong record of aligned goals, India's presence in the organization may establish an unproven ally as a defacto hegemon at the head of a regional military alliance. As the benefit and desire to be a member nation are weighed, India should be a critical engagement nation by the organization at the onset of its establishment.

Finally, we come to the controversial consideration of Taiwan as a full member, or at least an associate member. The inclusion of Taiwan as a member nation would undoubtedly infuriate China.[26] Their inclusion could trigger a rapid succession of negative responses that the fledgling organization may not yet be ready to address. Much like the time allowed for former Warsaw pact countries to be absorbed into NATO, the same time consideration must also be allotted for Taiwan. Much like the West partnering with Taiwan to assist in foreign military sales for its defense, the new "Asia NATO" should also maintain upkeep with the Taiwan partnership. For this reason, as with India, it should also serve as a critical engagement country whose path to full member status should be advanced once the fledgling organization is more established to counter Chinese reaction to its membership.

The evidence is clear that if left unchecked, China's territorial aggression in the region will expand.

V: DO THE BENEFITS OUTWEIGH THE RISK?

The proposal of creating a NATO-style organization to counter Chinese aggression is a significant risk but one that nations of the region must strongly consider. Similar to Æsop's fable, Bundle of Sticks, this Asian security pact would deliver strength-in-unity. The evidence is clear that if left unchecked, China's territorial aggression in the region will expand. When one considers similar dilemmas and threats from Russia, North Korea, Iraq, and the Violent Extremist (VEO) threat, it becomes clear that the United States cannot face the Chinese threat alone. To be victorious against China, we need an approach of unified action and a "Bundle of Sticks" coalition, because we are much stronger together.

The value of the proposed "Asian NATO" reveals itself when compared to hypothetical Chinese initiated crises; such as a potential invasion into Taiwan, South China Sea island-building, the sinking of a commercial or military vessel from the West, denial

of FONO (Freedom of Navigation and Overflight) for commercial shipping through the Strait of Malacca, and Cyber and Space-based attacks against the US and its Asian partners. These potential conflicts are feasible and conceivable with China's current technology, ambition, and global posture. The only way to counter such a robust threat is through unity with and amongst our Asia-Pacific partners. Existing partnerships such as ASEAN and SEATO are not up to the task, primarily since they are economic and trade-focused organizations. The model for success should be a more NATO-designed military organization that offers similar protections under an Article V charter.

In summation, Asia is a diverse, complex, and unique region that faces a cunning Tiger in the Jungle, waiting to pounce and secure more territory under the Chinese banner. Not just the physical environment, but also, they aim to seize the high-ground in every domain, including on the seas, in the air and in cyberspace aimed to become a true global hegemon. They also have a true unity of government approach, which must be defeated economically, diplomatically, and through information. The solution may be controversial, but the answer to defeat China is not another tiger, but rather, it is a bundle of sticks.

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THE USE OF EMERGING DISRUPTIVE TECHNOLOGIES BY THE RUSSIAN ARMED FORCES IN THE UKRAINIAN WAR

By Donatas Palavenis (Lithuania)

The Russian Ministry of Defence, on 18 March 2022, reported that Russian forces had used Kinzhal hypersonic missiles[1] and destroyed an underground depot for missiles and aviation ammunition in the village of Delyatina in Western Ukraine. US officials also confirmed the use of hypersonic missiles[2]. According to US officials, the launch aimed to test weapons and send a message to the West about Russia's military capabilities.

This article discusses available Russian hypersonic missiles and reviews other Russian military capabilities used in military operations in Ukraine that potentially use emerging disruptive technologies.

1. RUSSIAN HYPERSONIC MISSILES

First of all, it should be mentioned that hypersonic weapons are considered one of the disruptive technologies used in warfare, alongside such technologies as artificial intelligence, autonomous systems, big data, quantum technology, biotechnology, and novel materials[3].

Hypersonic missiles fly at a speed of at least Mach 5 or five times the speed of sound. There are two categories of hypersonic weapons: the first, when the rocket carrier carries the hypersonic glider and detaches from the carrier during flight, and the second when the rocket itself is hypersonic and is driven by high-speed engines throughout flight. Unlike ballistic missiles, hypersonic weapons do not follow a parabolic ballistic trajectory and fly at hypersonic speeds. They can manoeuvre freely enroute to the target, making them more challenging to detect and destroy in flight[4].

Russia currently has two types of hypersonic missiles in use today and is developing a third type of hypersonic weapon to carry nuclear warheads: the Avangard, Kinzhal, and 3M22 Zircon. The Avangard is a hypersonic glider launched from a ballistic missile, such as the SS-19 Stileto, SS-9 Scarp, and SS-X-29 Sarmat. According to Russian news sources, Avangard began combat duty in December 2019. The Russian army's arsenal was supplemented by the air-launched hypersonic rocket Kinzhal in December 2017. The Kinzhal can be launched from the TU-22 bomber or the MIG-31 fighter. Zircon, meanwhile, is a hypersonic cruise missile that is currently undergoing testing and should be operational in 2023[5].

The Kinzhal missile can also be used to destroy satellites in low earth orbit. It is estimated that the Kinzhal missile flies up to 2,000 km in distance and can reach altitudes up to 1,500 km. After intensive testing and the acceptance of the Kinzhal missile into the arsenal of the Russian army in 2017, it was used twice: in the Arctic region in 2019 and Syria in 2021. In both cases, the missiles were launched from the MIG-31 fighter jet. The total number of Kinzhal missiles produced is unknown.

A MiG-31 with a Kinzhal hypersonic missile payload being flown over Moscow during the 2018 Moscow Victory Day Parades, 9 May 2018.[6]

It should be noted that not every Russian MIG-31 fighter can carry a Kinzhal missile. A specialized version of the MIG-31K has been developed for this purpose[7]. The Russian Air Force is estimated to have up to 10 modernized fighter jets dedicated exclusively to this task[8]. The TU-22M3 bomber can carry four Kinzhal missiles. However, it is believed that no tests have been carried out from this platform[9].

The Russian army has a vast arsenal of non-hypersonic air-to-ground missiles, so the use of the Kinzhal missile in the war in Ukraine had more sym-

bolic than practical significance. Russia likely uses both the Avangard hypersonic missile and the ship-launched hypersonic cruise missile Cirkon to boost the word about the effectiveness of its hypersonic weapons.

2. USE OF OTHER MILITARY CAPABILITIES IN THE UKRAINIAN WAR THAT HAVE DISRUPTIVE TECHNOLOGIES

Russia has made significant progress in artificial intelligence and autonomous weapons systems, where several Russian institutes and military industries specialize[10]. However, a detailed analysis of the military equipment used by the Russian military in Ukraine reveals that only a small part of created and tested concepts that were presented publicly are used in practice. Even systems, prior widely used in Syria, are not intensively used in Ukraine. These disruptive technologies are not numerous and have not reached the required level of maturity.

> ... Russia's planned military operation was to last three days, and no high resistance was expected ...

2.1. USE OF UNMANNED AERIAL VEHICLES (UAVS)

Russia currently uses a small number of UAVs in Ukraine due to several factors. Firstly, Russia's planned military operation was to last three days, and no high resistance was expected, so the deployment of the UAVs was minimally planned due to the very high pace of the operation. Secondly, the demonstration of the successful air defence of Ukraine and electronic warfare (EW) against UAVs influenced the choice of the commanders of the Russian army. Also, the targets attacked by Russia are located throughout the entire territory of Ukraine, so the technical characteristics of the available UAVs do not allow them to support the operations at such depth and frequency. Russia's use of UAVs will likely intensify in the near future, as the war is slowly becoming static. The importance of these systems in combating positional warfare has been repeatedly demonstrated.

The Russian-made kamikaze UAV KUB-BLA was used in hostilities in Ukraine near Kyiv[11]. The operation of KUB-BLA is based on artificial intelligence algorithms, so it can autonomously identify the target and destroy it. The KUB-BLA has also been tested in Syria, where it has carried out many successful operations. The KUB-BLA is a hard-to-detect UAV that can fly up to 40 km, has a flight speed of up to 130 km / h, and can carry an explosive charge that weights up to one kilogram[12]. UAVs could be used to destroy unarmed or lightly armoured targets and create a surprise effect.

A Russian soldier prepares the Orlan-10 for launch during the Russian invasion of Ukraine, 30 March 2022.[15]

There were multiple reports and pieces of evidence that the Russian army in Ukraine uses UAV Orlan-10 and Inokhodets (Orian) intensively which also have disruptive technologies.

The Orlan-10 entered service in the Russian army in 2010. The UAV is modular, equipped with multiple cameras and other sensors. In 2020 Orlan-10 was upgraded with a laser designator. The Orlan-10 is often used with Russian long-range artillery and is also fit for ISR missions; it is a small UAV, with a wingspan of 1.8m., it can fly up to 18 hours at 70-150 km/h. There has been a total of 14 Orlan-10 destroyed in the conflict so far[13]. Furthermore, the modules could be composed of a day-light camera, a thermal imaging camera, a video camera, and a radio transmitter in a gyro-stabilised camera pod that is fitted under the fuselage. The cameras provide real-time intelligence, 3D maps, surveillance, and aerial reconnaissance of ground-based targets. The imagery, video, and other sensor data collected by the payloads are transmitted to the ground control station in real-time, through a data link using 3G/4G cellular network. Optionally, the Orlan-10 is fitted with EW capability and can differentiate between friendly and enemy means of transmitting the information. It can mount interference transmitters and set up zones for cellular jamming[14].

Meanwhile, the Inokhodets is a medium altitude and long-range (MALE) tactical UAV. So far only

one has been lost by the Russian army in Ukraine. The Inokhodets' maximum payload weight is 200 kg., it can fly at an altitude of 7.5 km, for a maximum of 24 hours with a speed of up to 200 km/h. The Inokhodets UAV is fitted with radar mounted at the rear. It also has an electro-optical, laser target finder, and infrared camera. The UAV is used for ISR and combat missions. The Inokhodets can be fitted with the 9M133 Kornet (AT-14 Spriggan), the second-generation man-portable anti-tank guided missile, which is used to destroy armoured vehicles and tanks. The UAV is capable to detect targets at a maximum range of 96 km and can fire a missile at a range of 4 km from the target[16].

Russia's Orion UAV (also known as Inokhodets) on display, 29 August 2020.[17]

As the war enters its second phase, meaning the Russian forces start focusing only on the Donetsk and Luhansk Regions, the usage of UAVs will intensify. Most likely we will see Altius, Forpost, and Volk-18 UAVs that are using artificial intelligence for ISR missions to detect and recognize targets and conduct autonomous operations.

So far, there are no signs that the Russian Navy is using its unmanned naval vessel Kadet-M, Intercontinental nuclear-powered nuclear-armed autonomous torpedo Poseidon, or unmanned underwater vehicle Galtel. Similarly, there are no indications from land forces that available unmanned ground vehicle Udar[18] is being used in the war. The Udar was developed on the basis of the BMP-3 infantry fighting vehicle, and the Marker, which was just recently upgraded with the ability to autonomously communicate with a group of ground robots[19].

It is likely, that unmanned ground and underwater systems are not being used at all because they are not fully developed and have limited interaction capabilities. Furthermore, legacy systems prove to be efficient at the current pace of war.

2.2. OTHER PLATFORMS WITH AI AND AUTONOMOUS CAPABILITIES

The Russian Federation aimed to supply the Navy with large patrol ships, capable of patrolling, monitoring, and protecting open and closed seas. So far, six ships were built under Project 22160, which was launched in 2014 aiming to reduce crew through automation and AI. The ship Vasily Bykov, one of three ships available in the Black Sea, participated in the attack on Snake Island on 24 February 2022 during the first day of the Russian invasion of Ukraine[20].

The T-14 Armata tank is another platform capable of autonomous combat operations which could be used as a testbed for unmanned tank technology. The tank features fully digitized equipment, an unmanned turret, and an isolated armoured capsule for the crew. So far, there is no evidence of T-14 Armata being used in Ukraine. Furthermore, there are already clear indicators that sanctions would hamper the production of T-14 Armata[21].

There were attempts to augment the onboard information management and target recognition of aircraft Su-35S and MiG-35 with AI. Only the Su-35S is engaged in the war. So far, one Su-35S was hit by Ukrainian air defence near Izium, in eastern Ukraine. The Su-35S aircraft featured thrust-vectoring, radar-absorbent paint, Irbis-E passive electronically scanned array radar, IRST (Infra-Red Search and Track), the Khibiny radar jamming system, the ultra-long range R-37M air-to-air missile, and a Kh-31 anti-radiation missile[22].

Additionally, the Russian army is using AI for the targeting automation artillery system. The MSTA-SM, manufactured by Rostex, has a new digital fire control system that allows increasing the rate of fire to 8-9 rpm. It has an improved land navigation computer that minimizes the time to input firing coordi-

> ... unmanned ground and underwater systems are not being used at all because they are not fully developed and have limited interaction capabilities.

nates and therefore can open fire within 30 seconds from standby. The MSTA-SM has been used intensively in the war[23].

A Russian POM-3 mine on display at an Army Exhibition, 23 August 2020.[25]

AI is also used in the anti-personnel mine POM-3 Medallion, which facilitates an autonomous target identification and activation. The POM-3 uses a seismic proximity fuse to detect human footsteps, based on vibrations proximate to the mine and comparing this data with seismic signatures in the munition's on-board catalogue. If the vibrations are similar enough to the correct seismic signatures in the landmine's memory and have sufficient and increasing amplitude (indicating movement towards the mine), the munition is triggered. The use of anti-personnel mine POM-3 by the Russian army in the Ukraine war has been confirmed in several locations[24].

2.3. COMMAND AND CONTROL ELEMENTS

Similar to the USA joint all-domain command and control (JADC2) concept, Russia has its own national defence management centre (NDMC) system. The goal of NDMC is to move data seamlessly between air, land, maritime, space, and cyber forces in real time. The NDMC was designed to receive information from the lowest military unit levels, and, following analysis and evaluation, feed the data directly to those at the strategic level. The outcomes of the first phase of the Ukraine war indicate that data from the lowest military unit was not processed within NDMC and the outputs were not brought at the strategic level[26].

Furthermore, there were no indications that the following systems utilizing AI were used at war: AquaHranitel developed by Formosa System, enabling oversight of Maritime domain; ACS of the Russian Military, developed by Ministry of Defence to be used as a system of systems for managing battlefield information; Aircraft management system Kasatka, developed by RadarMMS, for greater autonomy in aircraft, helicopters, and drones[27].

In terms of EW, besides the legacy and the updated systems, the Russian army is using the Bylina EW system, built by Ruselektronics, that applies AI to conduct ISR, information operations, and autonomous EW operations. The Bylina is also capable to degrade and jam communications satellite transmissions .

2.4. AIR DEFENCE SYSTEMS

The Pantsir-S air defence system, is one of the few systems that has been deployed to Ukraine. The Pantsir-S is used to shoot down attack drones, GRAD and Tochka-U missiles, and is enabled by AI for greater autonomy in air defence operations .

> Only a few weapon platforms possessing emerging disruptive technologies are observed on the battlefield in Ukraine.

Only a few weapon platforms possessing emerging disruptive technologies are observed on the battlefield in Ukraine. The most popular type remains UAVs, however, augmented legacy systems with AI remain widely used as well. Definitely, modest improvements brought by AI were not designed to increase the lethality of the weapon or system itself, but rather to provide enhancement allowing to narrow the decision-making cycle, find and indicate targets faster, or provide more automated solutions to deal with data.

IMPLICATIONS FOR NATO

There are relatively few systems enhanced by emerging disruptive technologies used by the Russian army in the war with Ukraine. Instead, Russian Forces are using legacy systems in combination with a few novel elements, like hypersonic missiles, UAVs, radars, or artillery automation systems that enable accurate surveillance on the target and target's elimination. The reason for this is mainly the availability and maturity of the systems. Sanctions in a long-term perspective would most likely impact the pace of development of weapons augmented with emerging disruptive tech-

nologies used by the Russian army.

Regardless of the fact that Russia has multiple EW capabilities, it has not performed well as Ukrainian forces are capable to command and control units. Decentralization of C2 elements, usage of normal mobile phones, and utilizing landlines are a few examples of successful counteraction implemented. It is clear that Russians did not do proper management of electromagnetic spectre, as some of their jamming is interfering with friendly communications.

Hypersonic weapons represent the biggest challenge at the moment as they can accommodate a nuclear charge, and can arrive at the target within a limited time and via unpredictable trajectory. As a result, surveillance, tracking, and counter missile systems should be augmented or reinvented to decrease the risk posed by a new type of weapon. Technologies such as directed energy weapons, particle beams, and other non-kinetic weapons offer the biggest potential for an effective defence. Cyber and electronic attacks could significantly degrade the effectiveness of weapons. In terms of detection, a network of space-based satellites and dispersed sensors would be required, which would also be linked with JADC2.

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TITLE	DATE	PUB #	DESCRIPTION/STATUS
ACC *Multi-Service Tactics, Techniques, and Procedures for Air Control Communication* **Public Release**	02 SEP 21	ATP 3-52.4 MCRP 3-20F.10 NTTP 6-02.9 AFTTP 3-2.8	Description: This publication establishes communications TTP for TAC C2 to manage air operations and control airspace and aircraft. It establishes TTP for force packaging and direct air support coordination, air-to-air communication, intercept, threat warning, threat surface-to-air warning, and air-to-surface communication. **Status: Current**
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AOMSW *Multi-Service Tactics, Techniques, and Procedures for Air Operations in Maritime Surface Warfare* **Distribution Restricted**	18 DEC 20	ATP 3-04.18 MCRP 3-20.4 NTTP 3-20.8 AFTTP 3-2.74	Description: This publication consolidates the Services' best TTP for missions involving air assets conducting maritime surface warfare (SUW). The objective is to enable seamless integration of joint air assets conducting maritime SUW. This publication lays the foundation for integrating forces in either preplanned or dynamic scenarios. **Status: Project Assessment**
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BREVITY (Change 1) *Multi-Service Brevity Codes* **Approved for Public Release**	28 MAY 20	ATP 1-02.1 MCRP 3-30B.1 NTTP 6-02.1 AFTTP 3-2.5	Description: This publication defines and standardizes multi-Service brevity codes agreed upon by each US Service branch. A brevity code provides no additional communications security. Brevity codes only serve to shorten transmissions. This publication does not include service-specific brevity codes nor is it synonymous with NATO APP-7. Updates to this publication have been shared with the NATO Standardization Office for inclusion or modification into Allied Communications Publications. **Status: Revision**
ISR OPTIMIZATION *Multi-Service Tactics, Techniques, and Procedures for Intelligence, Surveillance, and Reconnaissance Optimization* **Distribution Restricted**	3 SEP 19	ATP 3-55.3 MCRP 2-10A.8 NTTP 2-01.3 AFTTP 3-2.88	Description: This publications highlights key information to optimize ISR during the planning, execution, assessment phases and the PED process. This publication is useful to commanders, staff members, and new users desiring to know more about the ISR process. **Status: Revision**
TACTICAL RADIOS *Multi-Service Tactics, Techniques, and Procedures for Tactical Radios* **Distribution Restricted**	14 JUL 21	ATP 6-02.72 MCRP 3-30B.3 NTTP 6-02.2 AFTTP 3-2.18	Description: This publication is a single source, descriptive reference guide to ensure tactical level operators and planners have a comprehensive resource for planning, employing, creating, and operating radio networks (nets) in a joint Service environment. Highlighted in this MTTP are tactical radios operating in the HF, VHF, and UHF spectrums. **Status: Current**
TAGS *Multi-Service Tactics, Techniques, and Procedures for the Theater Air-Ground System* **Approved for Public Release**	21 MAY 20	ATP 3-52.2 MCRP 3-20.1 NTTP 3-56.2 AFTTP 3-2.17	Description: This publication describes how each of the Service component's systems operate within the Theater Air Ground System (TAGS) which is a conglomeration of systems. For this publication, TAGS refers to the organizations, personnel, equipment, and procedures that participate in planning and executing air-ground operations. **Status: Revision**

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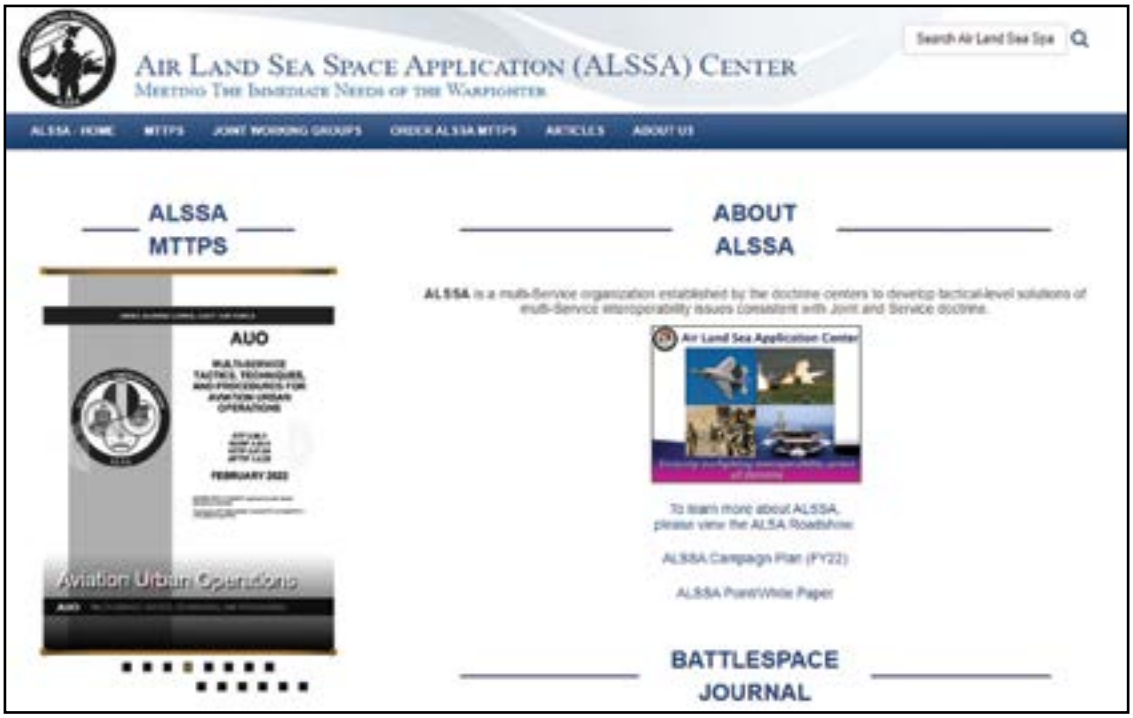

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