



**ENABLING PEOPLE, PROCESS, AND PRODUCT:
FINE-TUNING TARGETING FOR LARGE-SCALE COMBAT OPERATIONS**

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JCSP 50

Service Paper

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Enabling People, Process, and Results: Fine-tuning Targeting for Large-Scale Combat Operations

AIM

1. Due to the outstanding effects achieved by the implementation of the Joint Air Ground Integration Centre (JAGIC) in multiple NATO War Fighting Corps (WFCs), during large-scale combat exercises and trials, this paper advocates for the integration of the JAGIC, with an attached intelligence targeting element, into CAF at the divisional level. To scope this paper, all discussions of the JAGIC will assume that a required intelligence element has been attached.

INTRODUCTION

2. By fostering seamless coordination between air, ground, and potentially sea from the rear of the Joint Operations Centre (JOC), the JAGIC presents an opportunity for the CAF to respond more rapidly and effectively to evolving threats and shape the deep land battle. During trials with NATO Rapid Deployment Corps (NRDC) Spain, this author assisted in the prosecution of targets both before the JAGIC integration and after. A JAGIC was able to increase battlespace effects from 7 missions per hour to approximately 145 per hour.¹ This enhanced the Corp's shaping operations in the deep fight. During trials conducted in several WFCs, critical friction points were identified, these will be discussed later in this paper.

DISCUSSION

3. Located in the rear of the Joint Operations Centre (JOC), the JAGIC provides commanders a multidomain ability to coordinate, integrate, and control operations in division-assigned airspace (potentially sea) and efficiently collaborate requirements with external airspace elements outside of the division area.² The JAGIC co-locates functional areas in the same physical space. It is key to enable individuals within the JAGIC with the appropriate authorities, as this is how the center will support the commander's objectives and intent. Further, the JAGIC staff organization enables rapid shaping of the battle while managing the level of risk. The control and coordination of this cell with other centers are depicted in Figure 1 below.³

¹ Noted that these metrics would need to account for staff improvement and fatigue over extended operational periods. ATT it was a two week trial and CREVAL period.

² US Army and US Air Force, "The Joint Air Ground Integration Centre," *US Army Publishing*, no. No. 3-91.1 (April, 2019). https://armypubs.army.mil/epubs/DR_pubs/DR_a/pdf/web/ARN16449_ATP%203-91x1%20FINAL%20WEB.pdf.

³ Ibid

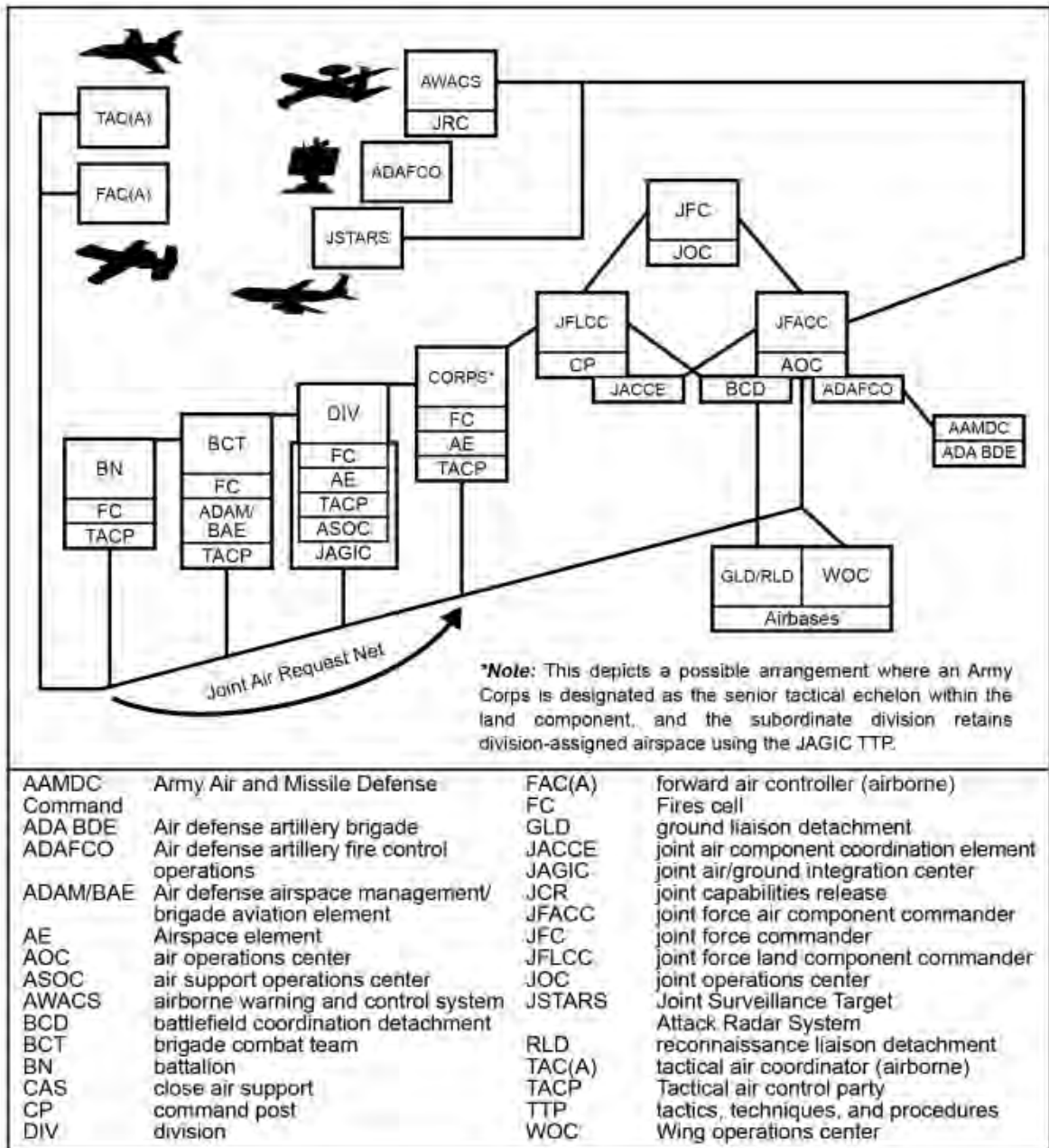


Figure 1 – US Army and US Air Force, "The Joint Air Ground Integration Centre,"
Source: *US Army and US Air Force*

4. In the above, the corps holds the highest tactical echelon, while divisions, along with their JAGIC are pivotal in integrating and managing airspace. For the purposes of this paper, division-assigned airspace is considered a volume of airspace in which the airspace control authority (ACA), the Air Component Commander (ACC) has overall responsibility for security and control of airspace. The ACA coordinates, develops, and issues the airspace control plan and airspace control orders (ACOs), which provide

guidance and procedures for the use of airspace and control of airspace activities.⁴ In order to enable the JAGIC to operate, the ACC will be required to delegate ACA to the Aerospace Controller embedded into the JAGIC for the allocated airspace.

5. Based on the tenet of centralized control and decentralized execution, the RCAF Combined Air Operations Centre (CAOC) enables the Joint Force (JF) ACC to exercise operational-level C2 of air forces; however, over time the RCAF has arguably become centralized control and centralized execution, which further hampers the process. This leaves the CAOC to coordinate with numerous C2 organizations including land, and historically does not delegate ACA further. Based on lessons from OEF and OIF, both the USA and NATO have integrated the JAGIC construct, which re-aligns aerospace procedural control of a designated divisionally assigned air space area to the Aerospace Officer seated within the JAGIC.⁵ The JAGIC then can de-conflict and clear all airspace users, including indirect fire. The inclusion of the Aerospace Officer in the JAGIC is an important nuance for the Army because as divisions organize “JAGIC-like” or Joint Fires Command and Control (JFCC) configurations, they do not include an ACA element. By controlling its airspace, the JAGIC has direct C2 for delivery of divisional lethal fires, including artillery, CAS, and air interdiction in one location.

Rapid Response Capabilities

6. As noted above, in a dynamic operational environment the JAGIC will enable the rapid ability of staff to shape the deep battle and respond to emerging threats. The JAGIC concept has been proven in operational, exercise, and multinational environments. A JAGIC’s seamlines communication and coordination between different elements of the joint force, enabling the immense increase of the rate of fire and effects through full spectrum deployment of military assets.

Efficient Resource Allocation

7. Through centralized planning and execution, a JAGIC helps optimize the use of limited resources. By avoiding duplication of effort and ensuring synergy between different elements of the joint force, resources can be allocated more efficiently, ultimately enhancing overall effectiveness. As an example during trials, it has been noted that adjustments to the level of ISR assets incorporated into the JAGIC must increase to provide an accurate picture of the physical battle damage assessment (BDA). Logically by increasing the number of targets prosecuted, target collection information must also increase. This friction point was resolved through ADHOC asset reallocation and an

⁴ "Canadian Air Force: Command and Control." *RCAF Aerospace Warfare Centre*, no. B-GA-402-001/FP-001 (June 22, 2017). <https://www.canada.ca/content/dam/rcaf-arc/migration/docs/en/aerospace-warfare-centre/b-ga-402-001-fp-001-royal-canadian-air-force-doctrine-command-and-control.pdf>.

⁵ Procedural control differs from positive control (as with an air-traffic-control radar) in that aircraft are deconflicted using a separation of space and/or time. To illustrate the difference in procedural and positive control from an Army perspective, imagine the difference between controlling the movement of subordinates through the use of unit boundaries (procedural control) vs. controlling their movement by watching a Blue Force Tracker feed and providing guidance over the radio (positive control).

updated intelligence collection plan; thereby providing the commander an accurate estimate of the effects on the battlespace as required.

Multifaceted Damage Sources

8. With operations spanning multiple domains, BDA now encompasses damage inflicted by a diverse array of weapons and platforms and is essential for informing decision-making and adjusting tactics in real-time. The interplay between land, and air assets, and potentially cyber can produce complex and interconnected effects on the battlefield in which intelligence analysts are tasked with rapidly collecting, processing, and disseminating BDA data to provide situational awareness. Collection in this domain must be tightly coordinated with JAGIC assets, thus integration of intelligence collection is essential to empowering the commander to make informed decisions with greater precision and timeliness.

Training and Doctrine Development

9. BDA was one of the friction points identified during the trials within NATO and must be a core aspect for consideration of the employment architecture. The ability to fuse real-time data from disparate sources including aerial reconnaissance platforms, unmanned aerial vehicles (UAVs), ground sensors, and intelligence feeds or provide process, exploitation, and dissemination (PED) is essential. PED needs to be enabled through the utilization of advanced data fusion algorithms and sensor integration techniques, which allows the JAGIC to aggregate and analyze data streams to generate comprehensive situational awareness assessments. These assessments will drive any refinements in joint tactics, techniques, and procedures (TTPs) in targeting. By bringing together subject matter experts and cooperating with Canada's allies, best practices can be identified, lessons learned can be shared, and new concepts can be tested and validated to enhance integration.

10. Through integration and interoperability with Alliance members, a nested collection planning will facilitate the rapid target prosecution and BDA, to enable the mission. This was noted as a point to improve during trials in a NATO WFC when, at the end of a day trial, the BDA Analyst was overwhelmed by the sheer number of targets prosecuted and could not provide an accurate first-line physical damage estimate to the Commander, nor provide data into the all-source intelligence cell (ASIC) for the daily estimation of the Adversary combat estimate to be included in the Intelligence Summary. This was a critical failure as the Commander was not enabled to make informed decisions.

11. Within the CAF Pan-Domain Force Employment Concept (PFEC), recognizes the need to integrate effects across domains and emphasizes collaborating with allies, partners, and whole-of-government. The JAGIC construct is currently employed in both US doctrine and NATO, as both have recognized the future warfighting environment as complex, dynamic, and complex in close engagement (CE) fighting. CAF practices must

adopt the agility, modularity, and connectivity, used by our allies.⁶ The JAGIC reorganizes staff elements to enable the CE battle and focuses on the division fight, thus the concept is in line with PFEC. Furthermore, the establishment of standardized operating procedures (SOPs) and mission rehearsal capabilities or exercises ensures operational continuity and readiness, mitigating the risk of the mission due to human error or procedural inefficiencies.

12. The collaboration and interoperability outlined in the PFEC can best be discussed through the Teams of Teams concept.⁷ According to Gen Stanley McCrystal, author of *Teams of Teams*, “we needed to enable a team operating in an interdependent environment to understand the butterfly effect ramifications of their work and make them aware of the other teams with whom they would be coordinating”. When Gen McCrystal refers to the butterfly effect, he describes an element of Chaos Theory, in which the

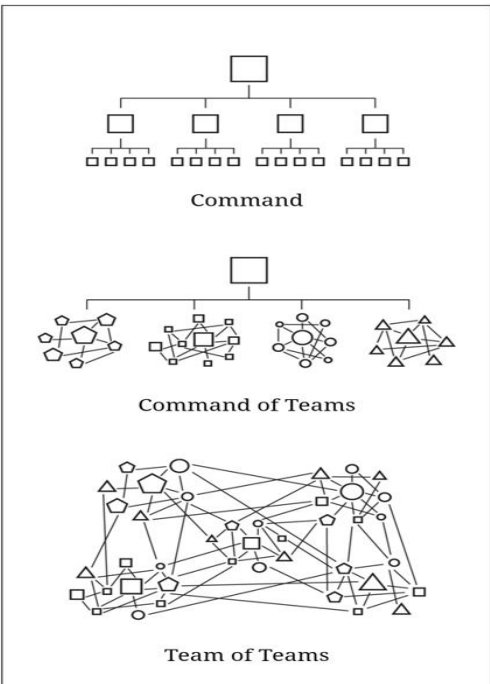


Figure 2 - Teams of Teams example of an enabled command in a complex environment

Source: McCrystal, *New Rules of Engagement in a Complex Environment*

localized change in a complex system can have a large effect elsewhere. By shifting CAF JFACC doctrine from a Command, as seen in Figure 2, to a Team of Teams, the web of coordination would enable substantially greater ground effects.

Responding to Complexity in Warfare

13. While Team of Teams is a facilitating framework for operational effectiveness, authorities must accompany the structure. In his article “Agility, Focus, and Convergence: The Future of Command and Control”, David Alberts argues that “*Command and Control (C2)* is an approach that, while it was once very effective in achieving its ends, is no longer the only possible or even the best approach that is available.” Dr Albert asserts that the situations for which C2 is best adapted have been transformed by the realities of the information age and that the assumptions upon historical C2 have been established are no longer effective, particularly in coalition operations or complex environments, and proposes that power to the edge model is more effective.⁸

⁶ Department of National Defense, “Pan-Domain Force Employment Concept,” *Canadian Forces* (Oct 6, 2023).

⁷ Stanley McCrystal, *Teams of Teams: New Rules of Engagement in a Complex Environment* (Penguin Random House, 2015).

⁸ David Alberts, “Agility, Focus, and Convergence: The Future of Command and Control,” *The International C2 Journal* Vol 1, no. Number 1 (Nov 1, 2007a).

Power to the Edge

14. The “power to the edge” concept emphasizes decentralization and empowerment of frontline units with the authority and capability to make timely decisions based on local information. When applied within the JAGIC construct the concept enhances response to emerging threats and opportunities. By leveraging advanced communication and information-sharing technologies, the JAGIC can provide real-time access to comprehensive situational awareness of the designated battlespace.

Command and Control: Convergence in Today’s Battlespace

15. In a paper discussing military doctrine, Mauer offers that traditional command and control are discussed together and that in the modern battlespace, the sound command should coordinate unity of effort and interoperability while reinforcing decentralized execution.⁹ Mauer also points out that doctrine and leadership should differentiate between the type of mission. For example, the command of peacekeeping operations in a coalition environment works on consensus planning, but in full-scale modern combat, decentralized execution is more appropriate.¹⁰

Information Technology

16. Enabling decentralized execution is a robust information backbone that plays a crucial role in enabling the functionality and effectiveness of the JAGIC through fusion and the integration of data. The sensors, intelligence reporting, and C2 systems (for land, and air) enable a real-time picture of the operational environment, enabling decision-making. This seamless cross-talk, communication, and collaboration between different elements seated together facilitates joint fires and targeting efforts to disrupt, degrade, or neutralize adversary assets in the deep fight setting the conditions for success in later phases of military operations.

Synergized Efforts

17. JAGIC promotes a holistic approach to military operations, fostering collaboration and synergy between air and ground forces, and is in line with the CAF PFEC. Figure 3 below illustrates the JAGIC employed in the most basic construct around a table, consolidating several pre-existing elements of current operations staff in one location. JAGIC Chief remains central to the table and like a conductor, the Chief orchestrates the battle by coordinating the fire support cell, airspace, aviation, missile defense, and ISR. Feet away from the JAGIC will be the Targeting Intelligence team developing the physical battle damage assessment (BDA), and making recommendations.

⁹ Cheryl and Alberts Roby David, "DoD Command and Control Research Program," *CCRP: Focus & Convergence for Complex Endeavors* (1994), 79-90.

http://www.dodccrp.org/files/N2C2M2_web_optimized.pdf.

¹⁰ David Alberts, "CCRP - Command and Control Research Program," *The Command and Control Research* VOL 1, no. NO 1 (2007b). http://www.dodccrp.org/html4/journal_v1n1_01.html.

It is a noisy, hectic, and effective entity and an outstanding example of multidomain operations in action.

Information Consumption and Dissemination

18. While intelligence support is critical to the concept, this paper explores the key reasons operationalizing the JAGIC at the divisional level would enhance communication, accelerated decision-making, and the synergistic integration of air and ground capabilities shaping the ground fight.

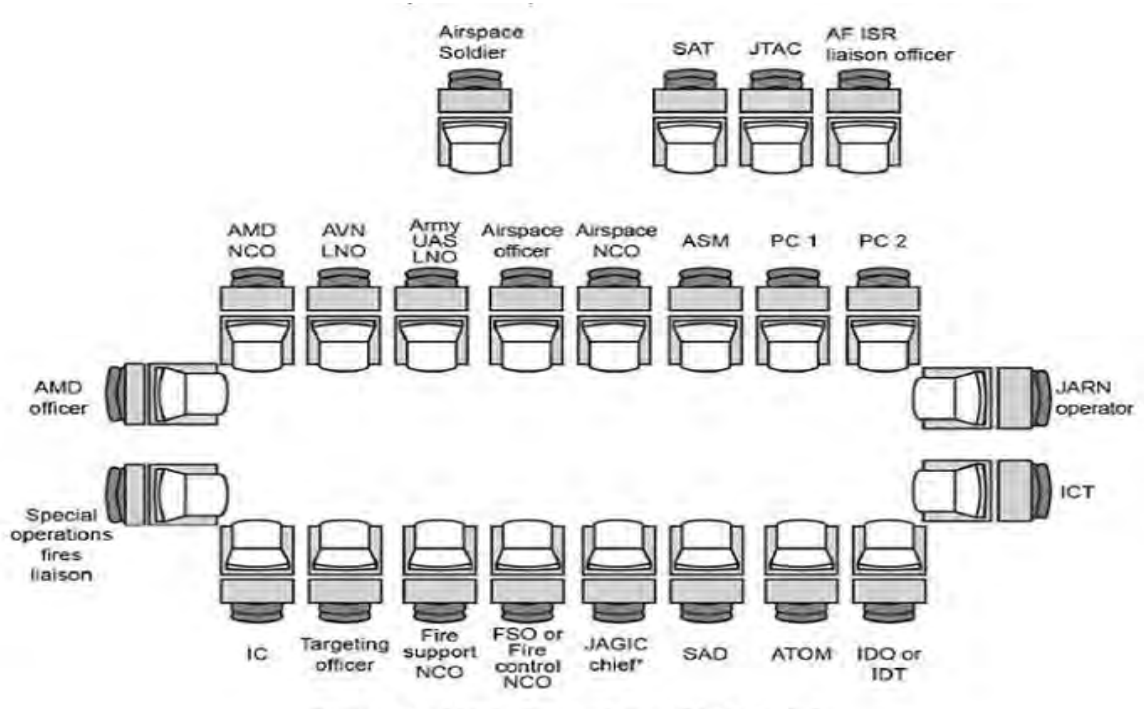


Figure 3: The Joint Air Ground Integration Center
Source: US Army, ATP 3-91.1

Adaptive Planning and Execution

19. The JAGIC’s value proposition is the ability to seamlessly integrate air and ground capabilities which ensures a versatile and comprehensive response to battlespace situations. The JAGIC creates emergence through its dynamic ability to respond to a complex environment successfully. The JAGIC embraces adaptive planning and execution processes that allow for rapid adjustment and iteration based on feedback from intelligence regarding the battlespace. This flexibility can give rise to strategies and tactics as commanders experiment with new approaches and adapt to changing circumstances on the battlefield.

CONCLUSION

20. In sum, the JAGIC is a force multiplier and takes traditional capabilities and enables them to maximum effectiveness at the division level. Reorganizing staff elements with the appropriate authorities will enable combat initiatives to be achieved. Understanding how the division employs joint assets to support the division through the JAGIC will require training. The JAGIC Chief role is like that of Joint Tactical Air Controller (JTAC) and requires a multi-dimensional understanding of the OE.

21. Like any staff shuffle, the JAGIC will not solve every challenge faced by commanders, but it is a modern concept that will enable ground forces effectively to move and maneuver. As CAF overcomes the lessons from 15 years of decentralized counterinsurgency warfare, the JAGIC becomes a coordinating, integrating, and controlling mechanism. The training requirement to make the cognitive shift into a large-scale combat focus. The seamless integration of air and ground capabilities offered by JAGIC empowers the military to respond rapidly, make informed decisions, and collaborate effectively. This transformation is essential for enhancing operational effectiveness in the face of an ever-evolving and dynamic global security landscape.

RECOMMENDATIONS

22. Implementing JAGIC is the CAF will require the following:

- a. Training Program: Selected personnel will need to be assigned to the JAGIC to ensure they are well-versed in both air and ground operations, communication protocols, and joint mission planning;
- b. SOP development: Establish SOPs in line with CAF allies that outline the roles, responsibilities, and procedures for JAGIC operations, including airspace management, close air support coordination, and integration with ground forces;
- c. Joint Exercises and Training: Conduct joint exercises and training drills involving air and ground units to familiarize personnel with JAGIC operations and enhance interoperability between branches; and
- d. Evaluation and Feedback Mechanisms: Establish mechanisms for ongoing evaluation and feedback to identify areas for improvement and ensure continuous refinement of JAGIC capabilities.