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# **The Integration of Naval, Air and Land Forces within the JOC of the JOINTEX Stage 3C Exercise**

Frederick M. J. Lichacz

**Defence R&D Canada – Ottawa**

Technical Memorandum  
DRDC Ottawa TM 2012-160  
December 2012

**Canada**



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## Abstract

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The Joint Experiment (JOINTEX) Stage 3C Exercise was conducted 6 - 21 February 2012 at the Canadian Forces Warfare Center (CFWC). The aim of this exercise was to exercise the Canadian Forces (CF) in a deployed Joint Task Force Headquarters (JTFHQ) in the planning and execution of a CF-led JTF conducting full spectrum operations within a multinational/coalition environment. The objective of this exercise was to support the 1<sup>st</sup> Canadian Division Headquarters' (1<sup>st</sup> Cdn Div HQ) effort to develop and practice integrated Canadian Forces (CF) joint operations in a multinational coalition setting.

The purpose of this Technical Memorandum is to present the findings about the procedural integration of the naval, air and land forces within the Joint Operating Centre (JOC) of the JTFHQ. In order to assess the procedural integration of the naval, air and land operators within the JOC, the researchers interviewed the operators about their role in the JOC, their primary lines of communication within the JOC, which systems they were using, and which operators they required around them in the JOC. Furthermore, the operators were requested to answer a number of questionnaires related to various procedural activities within the JOC.

Taken together, the interviews and responses to the questionnaires reveal that the operators within the JOC during JOINTEX Stage 3C were well integrated at a procedural level. The interviews revealed that the operators had the necessary personnel within the JOC to allow them to carry out their jobs. Moreover, the responses to the questionnaires showed that the operators were satisfied with the exchange of information within the JOC. To conclude, the JOINTEX Stage 3C exercise demonstrated that the operators serving within the JOC in this context were a well integrated group of operators from a procedural point of view.

## Résumé

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L'exercice sur la phase 3C de l'expérimentation interarmées (JOINTEX) s'est déroulé du 6 au 21 février 2012 au Centre de guerre des Forces canadiennes (CGFC). Cet exercice visait à former les Forces canadiennes (FC) au sein du Quartier général de la force opérationnelle interarmées (QGFOI) déployé en matière de planification et d'établissement d'une FOI menée par les FC et qui mène des opérations dans l'ensemble du spectre, et ce, à l'intérieur d'un environnement multinational et de coalition. L'objectif consistait à venir en appui au Quartier général de la 1<sup>re</sup> Division du Canada (QG 1 Div CA) dans l'élaboration et dans la mise en pratique des opérations interarmées et intégrées des FC dans un contexte de coalition multinationale.

L'objet du présent document technique (DT) est de présenter les conclusions concernant l'intégration des procédures des forces navales, aériennes et terrestres au sein du Centre d'opérations interarmées (COI) du Quartier général de la force opérationnelle interarmées (QGFOI). Afin d'évaluer l'intégration des procédures des opérateurs des trois éléments dans le COI, les chercheurs leur ont fait passer des entrevues portant sur leur rôle, sur leurs principales

lignes de communication, sur les systèmes qu'ils utilisent ainsi que sur les opérateurs qu'ils doivent avoir à leurs côtés au COI. En outre, les chercheurs ont demandé aux opérateurs de répondre à plusieurs questionnaires liés aux procédures à suivre au COI.

Pris dans leur ensemble, les entretiens et les réponses aux questionnaires ont permis aux chercheurs de constater que les opérateurs du COI étaient bien intégrés lors de la phase 3C du JOINTEX en ce qui a trait aux procédures. Ces entretiens ont permis de conclure que le nombre d'opérateurs travaillant au COI était suffisant pour leur permettre d'accomplir leurs tâches. Qui plus est, les réponses aux questionnaires ont mis en évidence la satisfaction des opérateurs en ce qui concerne l'échange d'information au sein du COI. Enfin, l'exercice sur la phase 3C du JOINTEX a permis de faire la preuve que, dans ce contexte, les opérateurs du COI étaient bien intégrés au groupe d'opérateurs sur le plan des procédures.

## Executive summary

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### The Integration of Naval, Air and Land Forces within the JOC of the JOINTEX Stage 3C Exercise

F.M.J. Lichacz; DRDC Ottawa TM 2012-160; Defence R&D Canada – Ottawa; December 2012.

**Introduction or background:** JOINTEX Stage 3C was a classified, distributed, computer-assisted Command Post Exercise (CPX) that was conducted at the Canadian Forces Warfare Centre (CFWC) during the period 6-17 February 2012. The aim of this event was to exercise the Canadian Forces (CF) in a deployed Joint Task Force Headquarters (JTFHQ), in the planning and execution of a CF-led JTF conducting full spectrum operations within a multinational/coalition environment.

The objective of the JOINTEX Stage 3C exercise was to supply a technical proof of concept to provide a realistic simulated environment to (1) enable collective and individual training for 1<sup>st</sup> Canadian Division Headquarters (1<sup>st</sup> Cdn Div HQ) and select CF enabling organizations and (2) support environment and Operational Command joint training objectives with emphasis on deployed Component Commands, Canadian Expeditionary Forces Command (CEFCOM), Canadian Special Operations Forces Command (CANSOFCOM) and Canadian Operational Support Command (CANOSCOM) processes and procedures.

The scope of this report is to report on the procedural integration amongst the naval, air and land component operators within the Joint Operating Centre within the simulated JTFHQ.

**Results & Significance:** Taken together, the interviews and responses to the questionnaires in this exercise reveal that the operators within the Joint Operational Command (JOC) during JOINTEX Stage 3C were well integrated at a procedural level. The interviews revealed that the operators had the necessary personnel within the JOC to allow them to carry out their jobs. Moreover, the responses to the questionnaires showed that the operators were satisfied with the exchange of information within the JOC. To conclude, the JOINTEX Stage 3C exercise demonstrated that the operators serving within the JOC in this context were a well integrated group of operators from a procedural point of view.

**Future plans:** There is a desire to continue this research methodology within future JOINTEX events in order to assist in the evaluation of further technical proof of concept initiatives.

## Sommaire

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### The Integration of Naval, Air and Land Forces within the JOC of the JOINTEX Stage 3C Exercise

F.M.J. Lichacz; DRDC Ottawa TM 2012-160; R & D pour la défense Canada – Ottawa; décembre 2012.

**Introduction ou contexte :** La phase 3C du JOINTEX est un exercice de poste de commandement (XPC) classifié, réparti et assisté par ordinateur qui a été mené au Centre de guerre des Forces canadiennes (CGFC) du 6 au 17 février 2012. Cet exercice visait à former les Forces canadiennes (FC) au sein du Quartier général de la force opérationnelle interarmées (QGFOI) déployé en matière de planification et d'établissement d'une FOI dirigée par les FC et qui mène des opérations dans l'ensemble du spectre, et ce, à l'intérieur d'un environnement multinational et de coalition.

L'objectif de l'exercice sur la phase 3C du JOINTEX consistait à obtenir une validation de principe technique en vue de mettre en place un environnement simulé réaliste. Cet environnement doit (1) permettre au Quartier général de la 1re Division du Canada (QG 1 Div CA) et à certaines organisations habilitantes des FC d'avoir la possibilité de suivre de l'instruction individuelle et collective. Il doit aussi (2) permettre d'appuyer les objectifs d'instruction interarmées du commandement opérationnel et des armées en mettant l'accent sur les procédés et les procédures des commandements de composantes déployés, du Commandement de la Force expéditionnaire du Canada (COMFEC), du Commandement des Forces d'opérations spéciales du Canada (COMFOCAN) ainsi que du Commandement du soutien opérationnel du Canada (COMSOCAN).

L'objet du présent rapport est de présenter un compte rendu de l'intégration des procédures devant être suivies par opérateurs des composantes navale, aérienne et terrestre au Centre d'opérations interarmées dans le QGFOI simulé.

**Résultats et importance:** Pris dans leur ensemble, les entretiens et les réponses aux questionnaires liés à cet exercice ont fait constater aux chercheurs que les opérateurs du COI étaient bien intégrés lors de la phase 3C du JOINTEX en ce qui a trait aux procédures. Ces entretiens ont aussi permis de conclure que le nombre d'opérateurs travaillant au COI était suffisant pour leur permettre d'accomplir leurs tâches. Qui plus est, les réponses aux questionnaires ont mis en évidence la satisfaction des opérateurs en ce qui concerne l'échange d'information au sein du COI. Enfin, l'exercice sur la phase 3C du JOINTEX a permis de faire la preuve que, dans ce contexte, les opérateurs du COI étaient bien intégrés au groupe d'opérateurs sur le plan des procédures.

**Perspectives :** On souhaite recourir de nouveau à cette méthodologie de recherche lors d'expérimentations interarmées à venir afin d'aider à l'évaluation d'autres initiatives de validation de principe technique.



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# 1 Introduction

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## 1.1 Background

JOINTEX Stage 3C was a classified, distributed, computer-assisted Command Post Exercise (CPX) that was conducted at the Canadian Forces Warfare Centre (CFWC) during the period 6-17 February 2012. The aim of this event was to exercise the Canadian Forces (CF) in a deployed Joint Task Force Headquarters (JTFHQ), in the planning and execution of a CF-led JTF conducting full spectrum operations within a multinational/coalition environment.

The objective of the JOINTEX Stage 3C exercise was to supply a technical proof of concept to provide a realistic simulated environment to (1) enable collective and individual training for 1<sup>st</sup> Canadian Division Headquarters (1<sup>st</sup> Cdn Div HQ) and select CF enabling organizations and (2) support environment and Operational Command joint training objectives with emphasis on deployed Component Commands, Canadian Expeditionary Forces Command (CEFCOM), Canadian Special Operations Forces Command (CANSOFCOM) and Canadian Operational Support Command (CANOSCOM) processes and procedures.

Ultimately, JOINTEX Stage 3C was devised to demonstrate the ability of the CF to plan, analyze and learn from a joint scenario-based, distributed, classified, network enabled collective training event.

## 1.2 Scope of this Report

A number of research objectives were examined during this event. Researchers were tasked by the Lessons Learned group of the CFWC to examine the degree of procedural integration amongst the naval, air and land component operators within the Joint Operating Centre (JOC), modelling and simulation lessons learned, joint exercise lessons learned, Land Component Support System (LCSS) functionality, and the technical integration of LCSS with Air Defence System Integrator (ADSI) and Global Command and Control System – Maritime (GCCS-M).

The scope of this report is to report on the procedural integration amongst the naval, air and land component operators within the Joint Operating Centre within the simulated JTFHQ.

## **2. Experiment Aim and Objectives**

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### **2.1 1<sup>st</sup> Cdn Div HQ Aim and Objective**

The principal aim of JOINTEX Stage 3C was to focus on a deployed operational level JTFHQ planning and executing a CF-led full spectrum operation in a multinational/coalition environment.

The Primary Training Audience (PTA) for JOINTEX Stage 3C was the 1<sup>st</sup> Cdn Div HQ. From the 1<sup>st</sup> Cdn Div HQ point of view, JOINTEX Stage 3C served as a training event to practice the processes intended for the 1<sup>st</sup> Cdn Div HQ staff. Their main objectives were to:

- Practice the six Formation Battle Task Standards (FBTS)
  - Manage concurrent plans/battle management procedures
  - Conduct hasty and deliberate resource allocation
- Practice Concept of Operations (CONOPs) planning
- Employ/evaluate decision support tools
- Practice air-land integration planning and execution
- Develop maritime-air-land integration of fires (joint fires)
- Develop reconstruction/development and stability operations, expertise and procedures
- Develop security sector reform and host nation security forces partnered planning capacity

### 3. Exercise Design

#### 3.1 Participants

There were a total of 45 military participants situated in the JOC of the JTFHQ during the JOINTEX Stage 3C exercise. There were also six operators from the Joint All Source Intelligence Cell, 11 operators from the J5 Cell, and 11 operators from the Sustainment Cell who provided responses to the surveys and interviews in this exercise. Figure 1 shows the layout of the JOC (i.e., Joint Battle Lab 2) and Appendix A provides a list of the operators who populated the JOC during the exercise and the other operators who provided responses to the surveys and interviews.

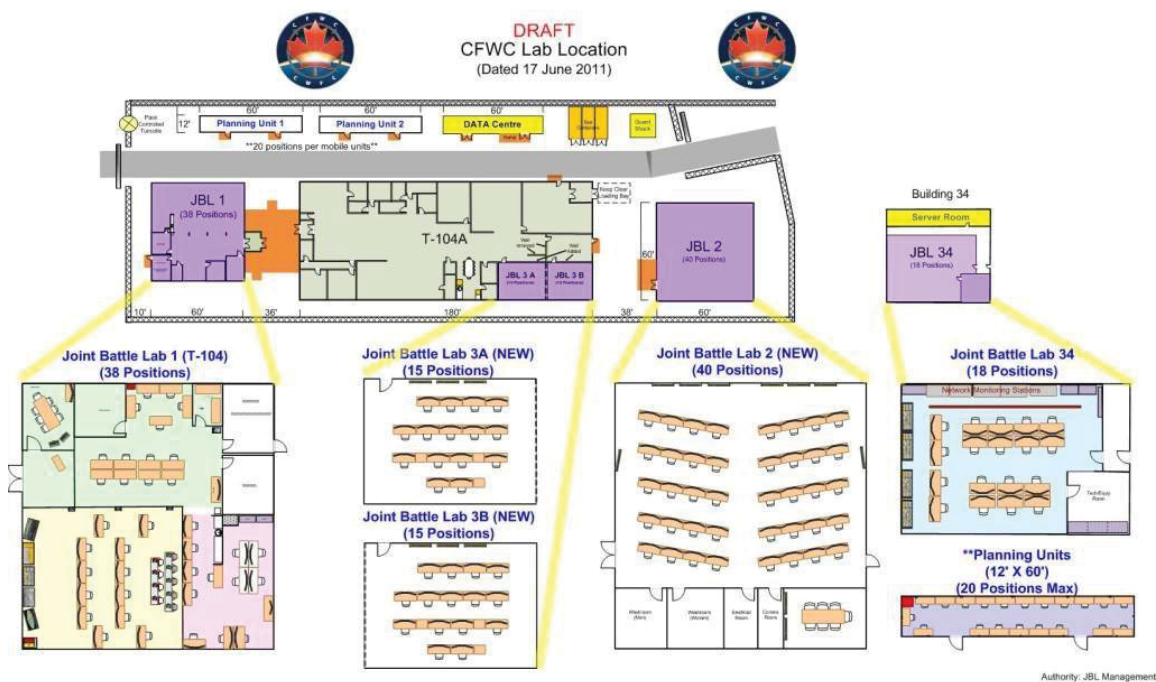


Figure 1: JOINTEX Stage 3C Layout

#### 3.2 Scenario

The scenario was based on a counter-insurgency operation and the primary Area of Operations (AO) was the Horn of Africa (HoA). The scenario includes operational planning for Canada to insert a two-star level HQ into an extant NATO and UN mission in SOMALILAND. 1st Cdn Div HQ will act as the operational-level JTF HQ. A Maritime Component Command (Element) (MCC(E)), Air Component Command (Element) (ACC(E)), and Special Operation Forces Component Command (SOFFC) will participate as the Secondary Training Audiences (STA).

High Control (HICON) will be played by CEFCOM as a white cell. The HQ's and Component Command Elements (CCEs) will conduct collaborative operational planning within an immersive, simulated, distributed and classified (level II Secret) environment.

The exercise scenario will cover the five days of planning for deployment (Part 1) and eight days of execution activities (Part 2). It will replicate the preparation for and conduct of the deployment of a two-star HQ into an extant UN-NATO mission in the HOA to the extent possible, introducing situations and problems typical of major undertakings of this nature.

Following several decades of interstate territorial disputes, internal conflicts, Islamist and ethnic clan-based insurgencies, civil war, weak governance, drought, famine and population displacement in the Horn of Africa region, by 2008 the political, security, economic and humanitarian situation had deteriorated to the point that it was deemed a significant threat to international peace and security. In that year, the African Union undertook a peacekeeping mission known as the African Union Mission in Somaliland and Puntland (AUMISP), undertook to monitor the contested border between Somaliland and Puntland and to prevent the proliferation of illegal movement and arms trafficking across the border. In that same year, United Nations Security Council Resolution UNSCR 1816 (2008) authorized a Chapter VII mission called the NATO UN Mission in the Horn of Africa (NUNHOA). The mandate for a long-term stabilization campaign established interstate boundaries, including recognizing Somaliland as a new independent state. It requested NATO to undertake a programme of technical assistance to the security forces of the Host Nations and also authorized the NATO-led force to provide logistical support and assistance as well as *in extremis* tactical support to the Australian (AU) force when requested and as required. The geographical scope of the mission encompassed Eritrea, Ethiopia, Puntland, Somalia, Somaliland and South Sudan.

The US has been operating in Somalia; the Netherlands with Belgium, Denmark and Poland in Eritrea; UK with Australia in Ethiopia; Canada in Somaliland; and France with Germany in South Sudan. A military base at Djibouti has been the location for Combined Joint Force Command (CJFC) NUNHOA HQ, and the HQs of the Maritime Component, Air Component and Special Operations Forces Component, logistical support services, the co-located airport for coalition strategic aviation assets and the nearby seaport for support to coalition naval ships undertaking maritime operations in and around the Gulf of Aden.

The AU has struggled since 2008 with the military and security aspects of the mission, even with considerable NATO support and assistance. In October 2011, the situation in the Horn of Africa began rapidly to deteriorate. No longer able to carry out the military and security functions of the UN mandate effectively in many areas, particularly along the Somaliland border with Puntland, on 28 November 2011, in a letter to the UN the AU requested that another force urgently assume this responsibility.

On 05 December 2011, the UN Security Council passed UNSCR 2020 (2011), providing a revised mandate (under Chapter VII) to support the territorial integrity, security and stability of the region and its member states, and also requested NATO to assume responsibility for the military and security aspects of the mandate from the AU (but not including Puntland territory). On 09 December 2011, NATO's North Atlantic Council (NAC) reached agreement on the revised mission and confirmed the command structure involving Supreme Allied Commander Europe (SACEUR), JTF Brunssum, CJFC NUNHOA and five CJTF HQs (increased to two-Star level



command), based on the same Lead Nations responsible for the Task Forces (TFs) already on the ground. On 05 January 2012, CJFC NUNHOA directed national TFs to assume control, within boundaries, from AU peacekeepers. UN Agencies, International Organizations and NGOs continue to be active and the EU will continue to be a major provider of development and economic assistance in the region.

**Strategic Aim.** The NUNHOA mission will continue to contribute to security and stability in the Horn of Africa as part of a Comprehensive Approach aimed at increasing those nations' capacities to maintain a stable environment with effective governance that provides a degree of economic and social advancement to all of their citizens. A stable Horn of Africa that participates in free and fair markets and contributes to global economic development will result in long term stability which is of vital interest to international peace and security.

**Strategic Political Objectives.** The strategic political objectives of the NUNHOA mission include:

- (1) Respect by all nations in the Horn of Africa region for national boundaries as recognized by the United Nations and international treaties.
- (2) The establishment of a secure and stable environment in the Horn of Africa region, working in co-operation with the Governments of Eritrea, Ethiopia, Somalia, Somaliland and South Sudan and in consultation with the African Union.
- (3) Enhancement of the capacities of the Governments of Eritrea, Ethiopia, Somalia, Somaliland and South Sudan to manage their national affairs, especially in the areas of political governance, maintenance of security, stability and national sovereignty and respect for the Rule of Law and Human Rights in all areas.
- (4) Freedom of legitimate maritime navigation and elimination of piracy throughout the region including the maritime approaches to nations in the Horn of Africa.
- (5) The safe and free return of refugees and displaced persons.
- (6) The provision of humanitarian assistance.
- (7) Economic reconstruction and development.
- (8) Improved democratization, education and social development of civil societies.

**Strategic Military Objectives.** The purpose of the NATO UN Mission in the Horn of Africa Military Force (NUNHOAMILFOR) is to establish a secure and stable environment in the Horn of Africa region and to improve the capacities of Host Nations' authorities to maintain democratic

governance and security within their respective sovereign territories. The strategic military objectives of the NUNHOA mission include:

- (9) The establishment of a secure and stable environment throughout the Joint Operations Area in the Horn of Africa region.
- (10) Effect force protection for NUNHOA military forces deployed throughout the JOA.
- (11) Assisting the nations in the Horn of Africa region to improve the capacities of their national security forces and institutions to enforce central control, maintain a secure and stable environment and extend the Rule of Law and respect for Human Rights throughout their respective jurisdictions.
- (12) Monitoring the freedom of navigation throughout the maritime portion of the JOA, including elimination of piracy.
- (13) Support NUNHOA's implementation partners, including UN UNPOL, UN Agencies, the EU, AU, International Organizations and NGOs within capabilities and limitations.
- (14) Gradually reducing the size, role and profile of the NATO force contribution on the basis of reviews of tasks, environment, Threat, risks and Host Nations' capacities as part of a Transition and Exit Strategy that is linked to the achievement of the Desired Military Strategic End State.

**Desired Military Strategic End State.** The Desired End State remains the establishment of a sufficiently secure and stable environment throughout the JOA and improved capabilities of Host Nations to the extent that full responsibility may be transferred to the local civil authorities or to another designated force.

### **3.3 Exercise Procedure**

The players responded to situations in accordance with their existing plans, policies and procedures. Implementation of response plans depicted actions that would be expected to occur during an event in order to provide a sound basis for internal evaluation. Decisions to direct personnel or resource deployments resulted in simulated movement of forces and equipment – there was no live play in this exercise.

### **3.4 Data Collection Methodology**

In order to determine the procedural integration of the maritime, air, and land components within the JOC, the operators within the JOC were asked four specific questions. First, they were asked what their specific role in the JOC was; second, they were asked who their primary lines of communication were with; third, the operators were asked which systems they were using and why; fourth, the operators were asked to identify which operators they need to have around them

in a real-life JOC. Collectively, it was believed that the answers to these questions would provide a detailed account of the connectivity within the JOC.

In addition to the interviews, the operators were also asked to respond to a number of questionnaires that examined issues pertaining to the timeliness and quality of information processing and obstacles to information processing (Björnstad, 2005, 2006), trust in automation (Muir, 1994; Muir and Moray, 1996) and workload (Hart and Staveland, 1988). These questionnaires reside in Annex B. These questionnaires were used to augment the procedural integration of the operators in the JOC.

## **4. Exercise Findings**

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### **4.1 Interview Results**

#### **4.1.1 Maritime Component Command**

The primary role of the Maritime Component in this exercise was to conduct Maritime Surveillance Operations in the AO to ensure freedom of navigation and to establish a NATO maritime presence, working in cooperation with security forces of the respective Host Nations, in order to eliminate maritime piracy.

The primary maritime operator in the JOC was the Maritime Command Element liaison officer (MCE LO). The role of the MCE LO is to be the liaison between the MCC and the Commander for planning. In the course of planning, the MCE LO needs to communicate with the ACC(E) and ISTAR because of the significant amount of air and Intelligence, Surveillance, Target Acquisition, and Reconnaissance (ISTAR) assets owned by the MCC and for airspace coordination. Moreover, because of the naval ships are equipped with a variety of Electronic Warfare (EW) capabilities, the MCE LO needs to have a line of communication with the Electronic Warfare Coordination Centre (EWCC). In this exercise, the ACC(E), ISTAR, and EWCC operators were located in the JOC for the MCE LO's use.

In this exercise, the MCE LO interface with the Australian amphibious team to help in the coordination of this maritime exercise. In reality, the MCE LO spends a great deal of time working with coalition partners.

The MCE LO also noted that he needed maritime representation in the J35 and J5 cells in order to assist with maritime planning. Unfortunately, the MCE LO did not have these maritime representatives in either the J35 or J5 cells. As a result, the MCE LO felt that he did not have sufficient situation awareness about relevant planning efforts.

#### **4.1.2 Air Component Command**

Representatives of the ACC in the JOC that were interviewed during this exercise consisted of the Air Component Command Element (ACC(E)), Tactical Air Control Post (TACP), Air Space Coordination Cell – In Command (ASCC - IC), ASCC Tech WO and ASCC Tech, and the Aviation Control Cell (AVN CC). For the air component in the JOC, their primary role is to monitor and clear airspace for the various air assets and weapons that the blue force would engage.

The ACC(E) is the ACC coordinating Liaison Officer within the JOC. The ACC is the ACC(E)'s main line of communication whereby the ACC(E) has the primary role of pushing Air Traffic Orders (ATO) to the ACC to develop Air Space Control Orders (ACO). According to the ACC(E), she receives information from Medevac and all cells that require air assets. This information is then sent to the ACC for further processing. In terms of who the ACC(E) requires to be in close proximity to her in the JOC, the ACC(E) noted that she would need the TACP close to her.

The TACP is responsible within his delegated authority to ensure effective coordination and integration of his resources with the others in the HQ, to resolve any conflicts, and to ensure maximum practical safety of all friendly forces. The TACP requests and coordinates the use of air fires in support of Brigade-level fires. According to the TACP, his main lines of communication are with the Joint Terminal Attack Controller (JTAC) and the Combined Air and Space Operations Centre (CAOC). Within the JOC, The TACP said that he would want the ASCC and the Fires Support Coordination Centre (FSCC) close to him in the DIV HQ.

The Aviation Control Centre (AVN CC) provides the expertise and capability to do air planning within the JOC. In this capacity and within the JOC, the AVN CC noted that his primary communication links are with J33 Ops, J3 Ops, Air Advisor (if Air Advisor not available then he needs to talk with Chief of Staff (COS)), ASCC, FSCC, Fast Air (TACP and ACC(E)). Moreover, the AVN CC also indicated that he would want to have direct communication with the aviation units in the theatre of operations (external links) in order to enhance real time air planning. With respect to the physical layout, and in particular to the location of operators in this exercise, the AVN CC said that for his purposes, this set up worked well for him.

The Air Space Coordination Centre in Command (ASCC-IC) and ASCC Technician monitor the airspace via ensuring the development of appropriate airspace coordination measures (e.g., creating Restricted Air Zones (ROZ), creating corridors, distributing air space by altitude, etc.) and is in charge of operating Air Defence System Integrated (ADSI) system. Related to this, the ASCC-IC monitors aircraft to ensure these aircraft maintain their designated altitude air space and provide early warning when the enemy aircraft are close to crossing into airspace that they should not be in.

The ASCC-IC passes Air Space Control Measure Requests (ACMR) in order to publish Air Space Control Orders (ASCO). In this exercise, the ASCOs are passed to NUNHOA (NATO UN Mission to Horn of Africa). In other missions, these orders would be passed up to the NATO group that was involved in the mission. The ASCC-IC work with guns aviation, ISTAR, TACP and supervises the ASCC Technician. As well, when the Commanding Officer of the artillery unit that belongs to the Division in theatre is not present, the ASCC-IC will advise the artillery unit CO about air defence. Incidentally, the artillery unit CO is typically in an office within the JOC and not out in the main JOC with other JOC members. The ASCC-IC also manages all airspace coordination requests in support of the Brigade-level engagement.

Within the JOC, the Operators in the JOC who need to be co-located and with whom the ASCC-IC and ASCC Tech interact in the JOC are: ASCC-Tech, TACP, MCC, FSCC-IC, FSCC Tech, ISTAR-IC, ISTAR-CC, AVN-CC and the ACCE.

### **4.1.3 Land Component Command**

There was no separate Land Component Command (LCC) within the JOC in this exercise, but the JOC was based on 1 Can Div. HQ, a land-centric HQ. Five separate Combined Joint Task Force (CJTF) HQs (increased to two-Star level command) were established, based on existing national Task Forces, with geographic responsibilities.

Most of the operators within the LCC were interviewed, including the J33 JOC Director, FSCC Tech, J3 Counter Improvised Explosive Device Coordination Centre (C IED CC), FSCC-IC and

FSCC Tech Duties, ISTAR IC, Senior Lower and Upper Duty Officer (DO), SOF, Request for Information (RFI) Manager, EWCC IC, J43, J13, Provost Marshall (PM) and Legal Advisor (LEGAD).

The J33 JOC Director is the main conduit for information passing between JOC and the Commander. The J33 JOC Director is the final filter of information going to the Commander. Moreover, the J33 JOC Director is the person who makes sure that the Commander's Intent is followed in the JOC. Because the job of the J33 JOC Director is workload intensive, due to his need to communicate information back and forth between the Commander and primary operators in the JOC, the J33 JOC Director highlighted the need for a COP Manager and a Staff Duty Officer. In particular, the Staff Duty Officer keeps track of all of the orders that are read and ensures that all paper work is done properly. Unfortunately, the COP Manager and Staff Duty Officer were missing in this exercise.

The roles of the FSCC – IC and FSCC Tech are to maintain the ground picture of all the friendly ground elements, hostile targets that are pertinent for the fire mission and neutral and no strike targets such as mosques and politically sensitive areas and monitor chat for fire missions (if a request comes in, resources are allocated for this request). These operators control all indirect fire (from ground if brigade needs more fire-power), investigate who has fire-power and request permission from the owner of the weapon(s) to see if that weapon is available for use. The FSCC-IC and FSCC Tech also ensure that all air space is clear before a weapon is used. Once the air space has been cleared, the owner of the weapon is told that it is ok to launch the weapon. If fast air support is needed, the FSCC operators will contact TACP to coordinate this action.

Within the JOC, the operators who need to be co-located with and interact with the FSCC-IC and FSCC Tech are the ISTAR CC, ASCC, TACP and the AVN CC.

When an IED incident is reported, the J3 C IED CC creates a trace on the event. Because the J3 C IEC CC does not have any Division IED assets, he must coordinate these assets with the engineers and IED personnel in J35 and Intelligence personnel in J5. An explosives ordinance team (a team that detonates IEDs) or route clearance teams (clearing or finding routes for ground traffic) is typically tasked to deal with the IED incident. Within the JOC, the J3 C IED CC interacts with the engineers (and this is the main group they interact with) and ISTAR.

The ISTAR IC coordinates all of the operational surveillance platforms (UAVs on behalf of J3) to satisfy information requirements for J2. If a UAV is needed, the person who needs it asks the ISTAR IC to coordinate this action. Also, the ISTAR IC provides force protection and projection (i.e., early warning) for ground troops.

The operators in the JOC who need to be co-located and with whom the ISTAR interacts with in the JOC are the ASCC, FSCC, TACP and Targeting (Targeting in the J35 cell).

The Lower and Upper DO examine all of the information that comes into the JOC and determine what it means. Although the Lower DO is the initial conduit for the information entering the JOC from lower level (Brigade Level) and the Higher DO is the initial conduit for relevant information between JOC and Higher HQ, both in essence work in tandem on the same duties. Both officers analyze information from all of the operators in the JOC and from external sources to determine the effect of this information on the current and future battle. Each officer reviews the

Commander Update Brief (CUB) before it is presented to the JOC, determines who in the JOC is best suited to handle problems as they occur and uses all the information coming into the JOC to develop good situation awareness of the battle. To this end, these operators are in charge of updating BattleView for the most up-to-date information from brigade level and coalition partners as well as updating ORION with any new incident information. Moreover, they collect all of the branches' Situational Reports (SITREPs) and put these SITREPs in a proper format in a single document that is sent to the Senior DO for his review and approval. When approval is given, this document is sent to the CR (Central Registry) to be logged and then sent to higher HQ.

According to the Lower and Higher DO, they interact with everyone in the JOC. These operators represent the hub of activity and information for the JOC.

The SOF LO is the coordinator between the SOF and JOC. For example when the SOF is planning to execute any operations, the advisor is informed about the space and time they need to perform that operation. The SOF LO will then inform the blue forces within the specified space to be out of that area at the time the SOF will be in that specific area. The SOF advisor liaises and coordinates all of the SOF resources. Not all of the SOF resources belong to JOC. Thus, if the commander needs any SOF resources, the SOF LO can provide the commander with the required resources. The SOF LO noted that he communicates with the J33 (JOC Director), Fires, SOF planner and ISR. However, he did not specify who he would want/need around him in the JOC. The SOF LO receives his SOF Situational Awareness through Outlook. This information includes boundary coordination and ROZ details.

The EWCC IC is responsible for electronic sensing and jamming operations. They own one 2EW squadron ground assets. This capability can either belong to 2CMBG or 1st Cdn Div. However, since the majority of their work is undertaken at the tactical level, they prefer to have this capability at 2CMBG. If the EWCC-IC is to do this sort of work 24/7, they would need two or three representatives in the JOC.

According to the EWCC-IC, in order to complete their task(s) the EWCC needs to interact with the following:

- EWCC IC Planners in J5 or J35.
- EWCC IC Analyst in JASIC.
- ISTAR for helping to create sensing overlays in BattleView.
- FSCC for helping them to create overlays in BattleView for targeting. FSCC also performs ground base jamming frequency in order to disturb enemies in terms of fire control, radio frequency, etc.
- ACCE and TACP to coordinate airborne platforms because some of the airborne assets have EW capabilities.
- MCC LO for any ship assets that may have EW capabilities. The EWCC may ask the MCC LO to help them to disturb the target on the shore or in the air.
- IACC who provide military support operation to IACC. For example if there is a legitimate target, the EWCC may coordinate with IACC to provide EW support. Most of the time IACC sends the request to EW to ask for their support. EW provides the effect or influence that IACC asked for.

- ASCC which provides them with reports of jamming. Analyst collects all the jamming reports for J2.

The EWCC-IC did not mention which operators he would prefer to have around him in the JOC.

The job of the Request for Information (RFI) Manager (i.e., J33 Ops MWO) is to receive RFI, review the RFI and then disseminate the RFI to the appropriate SMEs within the JOC. Thus, the RFI Manager is connected with all of the key people within the JOC.

The role of the J43 operator is to coordinate logistics from the Brigade level to higher HQ. Any and all logistics requests go through the J43. As a result, the J43 must liaise with key personnel in the JOC. The J43 must liaise with the ACC(E) for lift and support to ground movement and the AVN CC for helicopter lift. With regard to movement on the ground, the J43 communicates with the J3 in order to coordinate sustainment requirements as they pertain to the movement of food, fuel, and ammunition. Finally, the J43 must have a direct line of communication with the J4 who is not in the JOC. In this exercise, the J43 had access to all of the POCs necessary to do his job.

The role of the J13 is to take care of all human resource administration for the Division. The J13 keeps situation awareness of the number of resources that are in theatre and also has the job of collecting information about the number of people who are killed during the mission and those who are missing in action. In order to maintain a high degree of SA about the mission, the J13 interfaces with the administration staff from other nations. In the exercise, the J13's primary POC in the Division is with Higher HQ.

The PM coordinates all Military Police actions within the theatre of operations. Some of the functions that the PM undertakes are to coordinate where prisoners of war are to be held and to oversee the investigations into the deaths of Canadian soldiers in theatre. In a real-life mission, the PM would not sit in the JOC and would have other Military Police personnel around him to help him carry out his work. Despite his primary communications with each of the formation police units in theatre, the PM maintains communications with Med Adv, J2, J, ISTAR, Targeting and LEGAD.

The role of the LEGAD is to provide legal advice to the operational staff on matters related to targeting and ROEs. Accordingly, the LEGAD communicates primarily with J2 and J3 targeting as well as the SOF LO. Moreover, the LEGAD advises on issues related to national and international law which especially requires the LEGAD to have a direct line of communication with members of the higher HQ staff. While the LEGAD indicated that he had access to all of the relevant POCs, he noted that for his role, he does not need to be located within the JOC. In fact, the LEGAD indicated that if this were a real-life operation, he would reside outside the JOC as he needs more quiet and privacy to do his job.

In general, the interviews with the operators in the JOC indicated that the operators, from a procedural point of view were well integrated into the JOC. In detailing the persons that they communicated and needed to communicate with, the operators did not indicate that there were operators that they needed to communicate with that were not in the JOC or in the exercise for that matter. Moreover, there was a general agreement that the configuration of the JOC met the operators' communication needs.



However, there were two points of deviation from the overall positive views regarding procedural integration in the JOC. First, MCE LO noted that he needed but did not have maritime representation in the J35 and J5. Second, the J33 JOC Director highlighted the need for a COP Manager and a Staff Duty Officer in the JOC to assist him. Despite these shortcomings, it appears that JOINTEX 3C was successful at ensuring a high level of procedural integration of the operators within the JOC.

## 4.2 Questionnaire Results

The results from the questionnaires are found in Table 1. With regard to the Timeliness and Quality of Information Questionnaire, in general, the operators responded that they obtained information by receiving it from others and seeking it out equally as much. They indicated that they received an appropriate amount of information in order to make decisions and were neutral in how content they were that the information received helped them to make the best possible decisions.

The operators indicated that there were not too many concerns with the various potential obstacles to information sharing. At worst, the operators pointed to technological, organizational/procedural and lacking knowledge about who needs the information as the most salient obstacles to sharing information but these obstacles were not rated as highly problematic.

The operators professed a moderately high level of trust in the systems (i.e., automation) that they were required to use. Broadly, the operators indicated that they had a fairly good level of trust that the systems they were using would do what was expected of them.

The operators' responses to the NASA Task Load Index showed that the operators experienced a high level of mental demand associated with their tasks. Determining whether this reported level of mental demand represents a normal or excessive amount of mental demand should be left up to the Subject Matter Experts (SME) in this field. Moreover, the operators also reported elevated levels of effort required to accomplish their tasks as well as higher levels of frustration related to doing their tasks. It should be noted that while the operators did report elevated levels of mental effort, overall effort and frustration, these median responses (i.e., 7, 7 and 6, respectively) cannot be considered as too debilitating. However, these should also be discussed within the context of SMEs.

The responses to the Performance Measures Questionnaire revealed that in general, the operators did not consider there to be any extreme absence/failure to or enhancement of information exchange. This finding suggests that the operators viewed the exchange of information within the JOC as occurring within normal operating procedures with respect to the goals of this exercise.

## **5. Summary and Conclusions**

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Taken together, the interviews and responses to the questionnaires reveal that the operators within the JOC during JOINTEX Stage 3C were well integrated at a procedural level. The interviews revealed that the operators had the necessary personnel within the JOC to allow them to carry out their jobs. Moreover, the responses to the questionnaires showed that the operators were satisfied with the exchange of information within the JOC. To conclude, the JOINTEX Stage 3C exercise demonstrated that the operators serving within the JOC in this context were a well integrated group of operators from a procedural point of view.

## References

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Björnstad, A. L. (2005). *Part I: Allied Warrior 2004 – Pilot Study and Analysis of Cross-Cultural Organizational Issues* (FFI/RAPPORT-2005/01709). Kjeller, Norway: Norwegian Defence Research Establishment.

Björnstad, A. L. (2006). *Part II: Allied Warrior 2004 – Pilot Study and Analysis of Cross-Cultural Organizational Issues* (FFI/RAPPORT-2006/00112). Kjeller, Norway: Norwegian Defence Research Establishment.

Hart, S. G. & Staveland, L. E. (1988). Development of NASA-TLX (Task Load Index) scale: Results of empirical and theoretical research. In P. A. Hancock & N. Meshkati (Eds.), *Human Mental Workload: Advances in Psychology* (pp. 139-183). North Holland: Amsterdam.

Muir, B. M. (1994). Trust in Automation: Part I. Theoretical issues in the study of trust and human intervention in automated systems. *Ergonomics*, *37*, 1905-1922.

Muir, B. M. & Moray, N. (1996). Trust in Automation: Part II. Experimental studies of trust and human intervention in automated systems. *Ergonomics*, *39*, 429-460.

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## **Annex A. Participating Operators**

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The operators in the JOC are listed below (those in bold provided responses to the surveys and interviews in this exercise:

J33 Non-Commissioned Officer Higher

J7 Lessons Learned

J33 Duty Officer Higher

J33 Non-Commissioned Officer Lower

J33 Duty Officer Lower

Provost Marshall

**Maritime Control Element Liaison Officer**

**J33 Senior Duty Officer Higher**

**J33 Senior Duty Officer Lower**

**Australian Brigade Liaison Officer**

Canadian Joint Forces Command NUNHOA Liaison Officer

Influence Activities Coordination Cell

**Engineering Support Coordination Cell**

**Aviation Component Command Cell**

**Tactical Air Control Post**

**Air Component Command Element**

**Air Space Coordination Cell – In Command**

**Air Space Coordination Cell Technical Warrant Officer**

**Air Space Coordination Cell Technologist (2)**

Aviation Control Cell

**Fire Support Coordination Cell Technologist**

**Fire Support Coordination Cell In Command**

**Fire Support Coordination Cell**

**Fire Support Coordination Cell J35 Fires**

**Intelligence, Surveillance, Target Acquisition and Reconnaissance Coordination Cell**

**Medical Advisor 2**

Electronic Warfare Command Centre in Command

**J23-2**

**J63**

**Counter Improvised Explosive Device Coordination Centre**

J33 Operations Master Warrant Officer

**Legal Advisor**

Special Operation Force Advisor

J43

**J13**

**J35 Air Plans**

**Information Management Officer**

**J3 Ops**

**J35-2**

**J23 Duty Officer Lower**

**J35 Intelligence, Surveillance, Target Acquisition and Reconnaissance Component Command**

**ISSO/Information Management Officer 2**  
**J2-3**  
**J3**

Operators from the Joint All Sources Intelligence Cell:

JASIC Analyst – SGT 1  
JASIC Analyst – SGT 2  
J23-2  
JASIC Prod WO  
JASIC GEO WO  
J53

Operators from the J5:

J35 Branch  
J35 Engineer  
J53  
J65  
J5 Air Plans (2)  
J3 CIED/J5 ISTAR  
C-IED  
J9-5 CIMIC/PYOPS Planner  
Engineer

Operators from the Sustainment Cell (2 operators did not enter their title on surveys):

Influence Activities Analyst  
J9 Plans  
J6  
J43 NCO  
IA Analyst  
IACC Advisor  
IA Ops O  
PAO 2  
J1 RMS 1

## Annex B Questionnaires

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### JOINTEX 3C Questionnaires

Below are a series of brief questions designed to assess various aspects of this exercise. Your responses to these questions will aid in decisions that will be made about decision support tools and SOCDs.

Please note that no identifying information will be attached to the final results of the various questionnaires and their analysis. Additionally, no answers will be attributed to a given individual; all results will be used for group-oriented analysis.

Thank you in advance for your participation and cooperation in the completion of this questionnaire. Please specify your role (e.g., TACP, ACC(E)) during the JOINTEX 3C Exercise:

### B1. Timeliness and Quality of Information

**Q1. Most of the time, are you provided with the information you need or do you seek it out yourself?**

Provided by others

Seek it out myself

Both, equally much

**Q2. Do you feel like you receive too much or too little information in order to make decisions?**

Too much

Somewhat more than I need

Appropriate amount

Somewhat less than I need

Too little

**Q3. In general, how content are you with the information you receive (i.e. does it make you able to make the best possible decisions)?**

Very content

Somewhat content

Neutral

Somewhat discontent

Very discontent

## B2 Obstacles to Information Processing

In your opinion, what were the greatest obstacles for you to share information in this exercise? Please rate each from 1 to 5, 1 = lowest, 5 = highest. Mark only one box for each obstacle.

	1	2	3	4	5
1. Technical difficulties/shortcomings	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
2. Terminology barriers	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
3. Organizational/procedural hinders	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
4. Differences in service culture	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
5. Differences in organizational culture	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
6. Time constraints	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
7. Question of priorities	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
8. Approachability of commander	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
9. Lacking knowledge about who needs the information	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>

## B3 Trust in Automation

In regard to the C2 system that you use most in this exercise (please circle only one answer per question):

**Q1. To what extent does the C2 system perform its function properly?**

1	2	3	4	5	6	7	8	9	10
<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
Not at all								Extremely well	

**Q2. To what extent can the C2 system's behaviour be predicted from moment to moment?**

1	2	3	4	5	6	7	8	9	10
<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
Not at all								Extremely well	

**Q3. To what extent does the C2 system perform the task it was designed to do?**

1	2	3	4	5	6	7	8	9	10
<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
Not at all								Extremely well	

**Q4. What level of confidence do you have that the C2 system will be able to interface with other C4ISR systems in the future?**

1	2	3	4	5	6	7	8	9	10
<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
No trust							High level of trust		



**Q5. To what extent did the C2 system behave consistently (i.e., respond similarly to similar circumstances at different points during this exercise)?**

1	2	3	4	5	6	7	8	9	10
<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
Not at all							Extremely well		

**Q6. What is your overall trust in the C2 system?**

1	2	3	4	5	6	7	8	9	10
<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
No trust							High level of trust		

## B4 Task Load Index

We are interested in your feedback on the "workload" you experienced. Workload is a difficult concept to define precisely, but a simple one to understand generally. The factors that influence your experience of workload may come from the task itself, your feelings about your own performance, how much effort you put in, or the stress and frustration you felt. Considering your experience during the last portion of the experiment, please rate the following factors.

(CHECK ONE NUMBER per row)

### Q1. Mental Demand

How much mental and perceptual activity was required (e.g., thinking, deciding, calculating, remembering, looking, searching, etc.) for the task (easy or demanding, simple or complex, exacting or forgiving)?

1	2	3	4	5	6	7	8	9	10
<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
Low (Easy)							High (Demanding)		

### Q2. Physical Demand

How much physical activity was required (e.g., pushing, pulling, turning, controlling, activating, etc.) for the task (easy or demanding, slow or brisk, slack or strenuous, restful or laborious)?

1	2	3	4	5	6	7	8	9	10
<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
Low (Easy)							High (Demanding)		

### Q3. Temporal Demand

How much time pressure did you feel due to the rate or pace at which the tasks occurred (pace was slow and leisurely or rapid and frantic)?

1	2	3	4	5	6	7	8	9	10
<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
Low (little time pressure)							High (much time pressure)		

**Q4. Performance**

How successful do you think you were in accomplishing the goals of the tasks assigned to you?

<b>1</b>	<b>2</b>	<b>3</b>	<b>4</b>	<b>5</b>	<b>6</b>	<b>7</b>	<b>8</b>	<b>9</b>	<b>10</b>
<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
<b>Good Performance</b>					<b>Poor Performance</b>				

**Q5. Effort**

How hard did you have to work (mentally and physically) to accomplish your level of performance?

<b>1</b>	<b>2</b>	<b>3</b>	<b>4</b>	<b>5</b>	<b>6</b>	<b>7</b>	<b>8</b>	<b>9</b>	<b>10</b>
<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
<b>Low Effort</b>					<b>High Effort</b>				

**Q6. Frustration**

How insecure, discouraged, irritated, stressed and annoyed versus secure, gratified, content, relaxed and complacent did you feel during the task?

<b>1</b>	<b>2</b>	<b>3</b>	<b>4</b>	<b>5</b>	<b>6</b>	<b>7</b>	<b>8</b>	<b>9</b>	<b>10</b>
<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
<b>Low Frustration</b>					<b>High Frustration</b>				

**B5 Performance Measures**

Please rate each statement using the scale 1 to 5, where 1 indicates an absence/failure to demonstrate information exchange that would facilitate the goals of the exercise and 5 indicates an effective demonstration of information exchange that facilitates the goals of this exercise.

Q1. Evidence that shows the communications policies and procedures are followed during the exercise.

<b>1</b>	<b>2</b>	<b>3</b>	<b>4</b>	<b>5</b>
<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>

Q2. A clearly defined process or procedure is used to disseminate information and products between the different military organizations.

<b>1</b>	<b>2</b>	<b>3</b>	<b>4</b>	<b>5</b>
<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>

Q3. There is the use of standard terminology/lexicon to eliminate military organization-to-organization terminology confusion.

<b>1</b>	<b>2</b>	<b>3</b>	<b>4</b>	<b>5</b>
<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>

Q4. Appropriate personnel are trained in routing and disseminating information and intelligence.

<b>1</b>	<b>2</b>	<b>3</b>	<b>4</b>	<b>5</b>
<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>

Q5. The amount of information sharing between military organizations can be adjusted to accommodate dynamic response and recovery efforts.

<b>1</b>	<b>2</b>	<b>3</b>	<b>4</b>	<b>5</b>
<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>

Q6. Useful or actionable intelligence/information is passed between organizations.

<b>1</b>	<b>2</b>	<b>3</b>	<b>4</b>	<b>5</b>
<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>

Q7. Information products contain a feedback mechanism that can be used to gather additional information.

<b>1</b>	<b>2</b>	<b>3</b>	<b>4</b>	<b>5</b>
<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>

Q8. You are able to establish and maintain communications across Military organizations.

<b>1</b>	<b>2</b>	<b>3</b>	<b>4</b>	<b>5</b>
<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>

Q9. Higher-level decisions that are made within a single organization are communicated to other military organizations if it affects the overall operation.

<b>1</b>	<b>2</b>	<b>3</b>	<b>4</b>	<b>5</b>
<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>

Q10. The JOC has adequate staff to receive and transmit information to points of contact.

<b>1</b>	<b>2</b>	<b>3</b>	<b>4</b>	<b>5</b>
<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>

Q11. Acknowledgement of information by recipients is sent to sender(s).

<b>1</b>	<b>2</b>	<b>3</b>	<b>4</b>	<b>5</b>
<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>

Q12. Communication systems support on-demand, real-time interoperable voice and data communication.

<b>1</b>	<b>2</b>	<b>3</b>	<b>4</b>	<b>5</b>
<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>

Q13. Key officials are notified in the event of an incident using relevant tools and technologies (e.g., call down lists, short message service (SMS) messages, etc.).

<b>1</b>	<b>2</b>	<b>3</b>	<b>4</b>	<b>5</b>
<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>

## Annex C Questionnaire Results

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### C1 Timeliness and Quality of Information (N = 62)

	Q1	Q2	Q3	Q4
Mean	2.52	3.60	2.76	2.52
Median	3.00	3.00	3.00	3.00
Standard Error	.12	.16	.16	.12

### C2 Obstacles to Information Processing (N = 62)

	Q1	Q2	Q3	Q4	Q5	Q6	Q7	Q8	Q9
Mean	2.92	2.32	2.67	2.00	1.92	1.76	1.76	1.28	2.68
Median	3.00	2.00	3.00	1.00	2.00	1.00	1.00	1.00	3.00
Standard Error	.26	.27	.26	.25	.22	.18	.19	.09	.26

### C3 Trust in Automation (N = 62)

	Q1	Q2	Q3	Q4	Q5	Q6
Mean	6.16	6.20	5.88	5.29	6.52	6.00
Median	5.00	6.00	6.00	5.00	7.00	6.00
Standard Error	.43	.46	.45	.37	.39	.46

### C4 Task Load Index (N = 62)

	Q1	Q2	Q3	Q4	Q5	Q6
Mean	6.00	2.68	4.32	5.08	6.00	5.45
Median	7.00	2.00	4.00	5.00	7.00	6.00
Standard Error	.47	.35	.41	.55	.51	.57

### C5 Performance Measures (N = 62)

	Q1	Q2	Q3	Q4	Q5	Q6	Q7	Q8	Q9	Q10	Q11	Q12	Q13
Mean	2.9	2.9	2.8	2.8	3.2	3.4	2.9	3.3	3.3	3.4	3.3	2.8	3.0
Median	3.0	3.0	3.0	3.0	3.0	4.0	3.0	3.0	3.0	3.0	3.0	3.0	3.0
Standard Error	.15	.18	.24	.21	.16	.17	.17	.22	.13	.22	.20	.25	.21

## List of symbols/abbreviations/acronyms/initialisms

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1 <sup>st</sup> Cdn Div HQ	1 <sup>st</sup> Canadian Division Headquarters
ACC(E)	Air Component Command (Element)
ACO	Air Space Control Orders
ACMR	Air Space Control Measure Requests
ADSI	Air Defence Support Integrator
AO	Area of Operations
ASCC-IC	Air Space Coordination Centre (In Command)
ASCO	Air Space Control Orders
ATO	Air Traffic Orders
AU	African Union
AUMSIP	African Union Mission in Somaliland and Puntland
AVN CC	Aviation Control Centre
CANOSCOM	Canadian Operational Support Command
CANSOFCOM	Canadian Special Operations Forces Command
CAOC	Combined Air and Space Operations Centre
CEFCOM	Canadian Expeditionary Forces Command
CF	Canadian Forces
CFWC	Canadian Forces Warfare Center
CIED CC	Counter Improvised Explosive Device Coordination Centre
CJFC	Combined Joint Forces Command
CJTF	Combined Joint Task Force
CONOPS	Concept of Operations
COP	Common Operating Picture
CPX	Command Post Exercise
CUB	Commander Update Brief
DO	Duty Officer
EU	Europe
EW	Electronic Warfare
EWCC	Electronic Warfare Coordination Centre
FBTS	Formation Battle Task Standards

FSCC	Fires Support Coordination Centre
GCCS-M	Global Command and Control System – Maritime
HICON	Higher Control
HoA	Horn of Africa
HQ	Headquarters
ISTAR	Intelligence, Surveillance, Target Acquisition, and Reconnaissance
JOC	Joint Operating Centre
JOINTEX Stage 3C	Joint Experiment Stage 3Charlie
JTAC	Joint Terminal Attack Controller
JTF	Joint Task Force
JTFHQ	Joint Task Force Headquarters
LCC	land Component Command
LCSS	Land Component Support System
LEGAD	Legal Advisor
MCC	Maritime Component Command
MCE LO	Maritime Command Element Liaison Officer
Medevac	Medical Evacuation
NAC	North Atlantic Council
NGO	Non-Governmental Organization
NUNHOA	NATO United Nations Mission in the Horn of Africa
NUNHOAMILFOR	NATO United Nations Mission in the Horn of Africa Military Force
PTA	Primary Training Audience
RFI	Request for Information
ROZ	Restricted Operating Zones
SACEUR	Supreme Allied Commander Europe
SOF	Special Operation Forces
SOFCC	Special Operation Forces Component Command
TACP	Tactical Air Control Post
Tech WO	Technical Warrant Officer
UNSCR	United Nations Security Council Resolution
UN – NATO	United Nations – North Atlantic Treaty Organization
UNPOL	United Nations Police

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The Joint Experiment (JOINTEX) Stage 3C Exercise was conducted 6 - 21 February 2012 at the Canadian Forces Warfare Center (CFWC). The aim of this exercise was to exercise the Canadian Forces (CF) in a deployed Joint Task Force Headquarters (JTFHQ) in the planning and execution of a CF –led JTF conducting full spectrum operations within a multinational/coalition environment. The objective of this exercise was to support the 1<sup>st</sup> Canadian Division Headquarters' (1<sup>st</sup> Cdn Div HQ) effort to develop and practice integrated Canadian Forces (CF) joint operations in a multinational coalition setting.

The purpose of this Technical Memorandum is to present the findings about the procedural integration of the naval, air and land forces within the Joint Operating Centre (JOC) of the JTFHQ. In order to assess the procedural integration of the naval, air and land operators within the JOC, the researchers interviewed the operators about their role in the Joint Operating Command (JOC), their primary lines of communication within the JOC, which systems they were using, and which operators they required around them in the JOC. Furthermore, the operators were requested answer a number of questionnaires related to various procedural activities within the JOC.

Taken together, the interviews and responses to the questionnaires reveal that the operators within the JOC during JOINTEX Stage 3C were well integrated at a procedural level. The interviews revealed that the operators had the necessary personnel within the JOC to allow them to carry out their jobs. Moreover, the responses to the questionnaires showed that the operators were satisfied with the exchange of information within the JOC. To conclude, the JOINTEX Stage 3C exercise demonstrated that the operators serving within the JOC in this context were a well integrated group of operators from a procedural point of view.

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