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## RE-BALANCING RCAF COMMAND AND CONTROL – IDENTIFYING AND MANAGING THE “TRADE-OFF”

Lieutenant-Colonel J.E. Knutsson

**JCSP 40**

### ***Exercise Solo Flight***

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By Lieutenant-Colonel J.E. Knutsson  
Par le lieutenant-colonel J.E. Knutsson

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## INTRODUCTION

The topic of command and control (C<sup>2</sup>) within the Royal Canadian Air Force (RCAF) continues to generate considerable interest and debate. In fact, C<sup>2</sup> doctrine with respect to developing joint C<sup>2</sup> arrangements and delegation of authority has been, and continues to be, an on-going challenge facing the leadership of the RCAF.<sup>1</sup> Notwithstanding the substantial improvements in doctrine and professional development recently spearheaded by the Canadian Forces Aerospace Warfare Centre (CFAWC), the RCAF, as a whole, continues to struggle to fully comprehend and apply the principles of C<sup>2</sup>. In 2007, Dr. Allan English grimly summarized the RCAF's enduring problems with C<sup>2</sup>:

...during the almost 40 years since the unification of the CF, the command structure of Canada's air forces has been subjected to a series of ad hoc, expedient changes that have resulted in disjointed, sometimes dysfunctional, C<sup>2</sup> arrangements that continue to plague the Canadian Air Force to this day.<sup>2</sup>

In contrast to this situation, the fundamentals of C<sup>2</sup> are well understood and institutionalized within the Canadian Army, from doctrinal theory to practical execution.<sup>3</sup>

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<sup>1</sup> Allan English and John Westrop, *Canadian Air Force Leadership and Command: The Human Dimension of Expeditionary Air Force Operations* (Trenton, ON: Canadian Forces Aerospace Warfare Centre Production Section, 2007), 153.

<sup>2</sup> *Ibid.*, 3.

<sup>3</sup> G. E. Sharpe, "C<sup>2</sup> Evolution from an Air Force Perspective," in *Air Force Command and Control*, eds. Douglas Erlandson and Allan English (Winnipeg, MB: Canadian Forces Training Material Production Centre, 2002), 12.

Further complicating matters is the RCAF's current interpretation and application of air power's master tenet, centralized control and decentralized execution. Existing RCAF doctrine has embraced the Joint Forces Air Component Commander (JFACC) / Combined Aerospace Operations Centre (CAOC) model as the chosen C<sup>2</sup> architecture for centralized control and continues to holistically apply this C<sup>2</sup> structure universally to all RCAF assets (fixed and rotary wing).<sup>4</sup> While such a *fixed wing* C<sup>2</sup> model is highly effective in centrally controlling air assets at the operational and strategic level, it has limitations in keeping pace with the dynamic operational tempo and unpredictability prevalent with tactical aviation operations operating outside of the Air Component Commander (ACC) construct.<sup>5</sup>

Decentralized execution would appear to be the answer to increase operational flexibility, freedom of action, and generate initiative but according to RCAF doctrine it is specific to the *assigned* mission. Furthermore, the scope of decentralized execution is dictated by the degree of centralized control employed, which in turn, is dependent on the operational situation and at what level the decision making authority is

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<sup>4</sup> Department of National Defence, Canada, B-GA-401-000/FP-001 *Canadian Forces Aerospace Command Doctrine* (Trenton: Canadian Forces Aerospace Warfare Centre Production Section, 2012), 31 – 33.

<sup>5</sup> 1 Wing Headquarters, 3000-1 (ACCE Dir) *Air Component Coordination Element Post Exercise Report - Exercise Maple Resolve 1201*, 7 December 2012, 6.

located.<sup>6</sup> Therefore, although the primary tenet of centralized control and decentralized execution appears straight forward in theory, it is in actuality, quite complex.

Accordingly, the issue at hand, with respect to employing air power, is determining the *appropriate level* where decision authority should be placed; factoring in the *complexity* and *nature* of the operating environment.<sup>7</sup> While a highly centralized JFACC construct is suitable for major combat operations, such as the air campaign during Gulf War I, a more decentralized construct, favouring mission command and delegated authority, is required to operate successfully in the contemporary operating environment. Simply put, the nature of the mission (or conflict), the assessed level of risk, and the level of flexibility needed will dictate the C<sup>2</sup> construct required – a critical *up-front* decision as part of the Operational Planning Process (OPP).<sup>8</sup>

Hence, this paper will argue that the RCAF's propensity for a common, centrally controlled, force employment C<sup>2</sup> architecture

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<sup>6</sup> Department of National Defence, Canada, B-GA-401-000/FP-001 *Canadian Forces Aerospace Command Doctrine* (Trenton: Canadian Forces Aerospace Warfare Centre Production Section, 2012), 20 - 22.

<sup>7</sup> Jeffrey Hukill and Daniel Mortensen, "Developing Flexible Command and Control of Airpower," *Air & Space Power Journal* 25, no. 1 (Spring 2011), 53 - 54.

<sup>8</sup> Joint Staff J7 - Deployable Training Division, *Insights and Best Practices Focus Paper: Geographic Combatant Commanders (GCC) Command and Control Organizational Options*, First ed. (Suffolk, VA: Joint Staff J7 Joint Training Directorate, March 2014), 13.

constrained by the JFACC/CAOC model is unbalanced in its applicability towards aerospace functions traditionally employed outside of the ACC's span of control. In order to support this position, this paper will be divided into four sections. The first two sections analyze the concepts of command, control, C<sup>2</sup>, and the aerospace precept of centralized control and decentralized execution. Upon establishing the requisite baseline knowledge of Air Force C<sup>2</sup> concepts, the third section explores a proposed methodology to influence and shape RCAF C<sup>2</sup> design concerning force employment. Finally, the fourth section culminates the discussion with the RCAF's evolving Air Task Force (ATF) C<sup>2</sup> framework.

### **MOVING BEYOND THE DEFINITIONS OF COMMAND, CONTROL, AND C<sup>2</sup>**

Considering that effective command and control is a fundamental requirement to the efficient application of military power, it is alarming that the state of command and control theory, both in Canada and internationally, can be described as bleak, confusing, and containing disjointed definitions.<sup>9</sup> Case in point would be the military lexicon defining command, control, and C<sup>2</sup> where "the definitions themselves are circular and redundant."<sup>10</sup> Upon reviewing RCAF command doctrine (B-GA-401), the command definition makes use of the word control; the control definition borrows concepts from the command definition; and the

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<sup>9</sup> Ross Pigeau and Carol McCann, "Re-Conceptualizing Command and Control," *Canadian Military Journal* Spring (2002), 53.

<sup>10</sup> *Ibid.*, 53.

C<sup>2</sup> definition is a longer reiteration of control.<sup>11</sup> Consequently, it shouldn't come as surprise that "the post-Cold War RCAF has experienced a dramatic erosion in the general understanding of the principles of command and control [linking theory to practice]."<sup>12</sup>

The first step required to solving this troubling situation is a RCAF professional military education system that promotes critical thinking beyond the basic definitions of command, control, and C<sup>2</sup>. Fortunately, the Pigeau and McCann command framework, embedded within the Canadian Forces College curriculum, provides an alternative means of conceptualization to facilitate a greater understanding of C<sup>2</sup> theory and its application to military operations.

Pigeau and McCann define command as "the creative expression of human will necessary to accomplish the mission." The primacy of the human element is based on several facts. "Only humans demonstrate the range of innovation and flexible thinking to solve complicated and unexpected problems." Only humans are capable of accepting responsibility for success or failure. Lastly, only humans can leverage

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<sup>11</sup> Department of National Defence, Canada, B-GA-401-000/FP-001 *Canadian Forces Aerospace Command Doctrine* (Trenton: Canadian Forces Aerospace Warfare Centre Production Section, 2012), 4.

<sup>12</sup> Pux Barnes, *Command or Control? - Considerations for the Employment of Air Power in Joint Operations* (Trenton, ON: Canadian Forces Aerospace Warfare Centre, May 2013), 1.

“dedication, drive, and motivation” to improve collective performance.<sup>13</sup>

This perspective of command is logical and provides emphasis on the *ends, ways, and means* of executing command.

To differentiate command from control, Pigeau and McCann define control as “those structures and processes devised by command to *enable it* [emphasis added] and to manage risk.” Additionally, this definition comprises of “the personnel, facilities, and procedures for planning, directing, and coordinating [and monitoring] resources in the accomplishment of the mission.”<sup>14</sup> Finally, command and control are related to each other succinctly in that “command creates and changes the structures and processes of control to suit the uncertain military situation, thus making command pre-eminent.” Secondly, the enduring relationship can be expressed that “command cannot be exercised without control, but control is meaningless without command.”<sup>15</sup>

Distinct from the doctrinally accepted definitions of command and control, Pigeau and McCann clearly distinguish the concepts of command versus control and how they relate to each other – the essence of command being creativity and will (human element); the essence of control being

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<sup>13</sup> Ross Pigeau and Carol McCann, "Re-Conceptualizing Command and Control," *Canadian Military Journal* Spring (2002), 54-56.

<sup>14</sup> *Ibid.*, 54-56.

<sup>15</sup> *Ibid.*, 62.



structure and process (human creations).<sup>16</sup> Finally, the last element to be addressed is C<sup>2</sup> (command and control as a single entity) which is defined as “the establishment of common intent to achieve coordinated action.”<sup>17</sup>

In line with the alternate definition of C<sup>2</sup>, intent becomes the focus of realizing coordinated military action which goes far beyond the RCAF view of C<sup>2</sup> being a process.<sup>18</sup> Pigeau and McCann then convey the importance of intent being incorporated into the means of achieving coordinated action in two statements. “Without coordinated action, military power is compromised,” and “without common intent, coordinated action may never be achieved.”<sup>19</sup> Thus, intent is a “set of connotations associated with a specific aim or purpose” and correctly inferring the commander’s intent, both explicitly and implicitly, becomes the primary task – an essential component of military thought.<sup>20</sup> The Intent Pyramid (Figure 1) provides an excellent depiction of the relationship between explicit intent (orders, briefings, back-briefs) and implicit intent (unstated expectations shaped by experience, training,

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<sup>16</sup> *Ibid.*, 62.

<sup>17</sup> Allan English, *Command and Control of Canadian Aerospace Forces: Conceptual Foundations* (Trenton, ON: Canadian Forces Aerospace Warfare Centre Production Section, 2008), 14.

<sup>18</sup> Department of National Defence, Canada, B-GA-401-000/FP-001 *Canadian Forces Aerospace Command Doctrine* (Trenton: Canadian Forces Aerospace Warfare Centre Production Section, 2012), 4.

<sup>19</sup> Allan English, *Command and Control of Canadian Aerospace Forces: Conceptual Foundations* (Trenton, ON: Canadian Forces Aerospace Warfare Centre Production Section, 2008), 14.

<sup>20</sup> *Ibid.*, 101.

doctrine, culture, and values). Although implicit intent is not directly communicated, it inherently exerts substantial influence on the interpretation and achievement of a common intent.

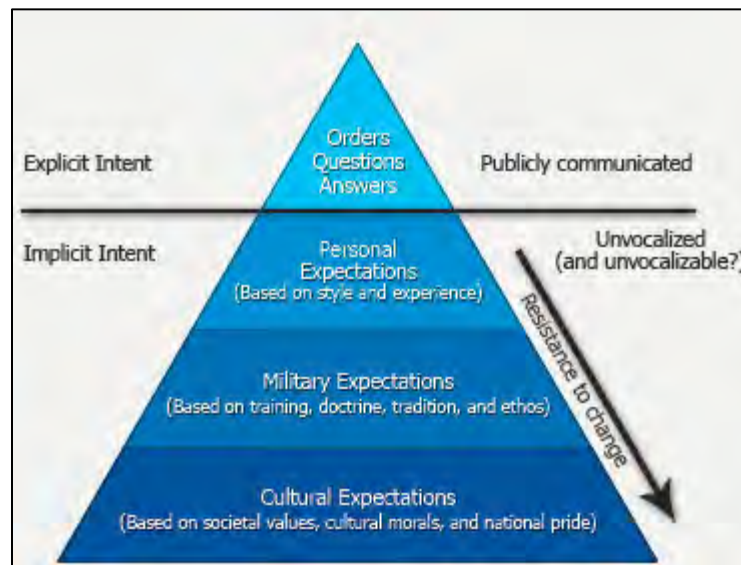


Figure 1 – The Intent Pyramid (illustrating the relationship between explicit and implicit intent)<sup>21</sup>

Having analyzed the elements of command, control, and C<sup>2</sup> beyond their doctrinal definitions, merging theory with pragmatism, it is now appropriate to transition to the master tenet of aerospace power – centralized control and decentralized execution.

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<sup>21</sup> *Ibid.*, 16.

## THE MEANING OF CENTRALIZED CONTROL AND DECENTRALIZED EXECUTION

Despite being historically justified and encapsulated throughout aerospace doctrine, the guiding principle of air power – centralized control and decentralized execution – continues to be subject to numerous interpretations and definitions. As an example, during the 2002 Air Symposium at the Canadian Forces College, it was noted that “while widely used [and championed] by those describing Air Force C<sup>2</sup>, it [centralized control and decentralized execution] is not well understood.”<sup>22</sup> Furthermore, some participants continually interchanged “centralized control” with “centralized command” and when asked to explain the difference, they “were unable to do so in a convincing manner.”<sup>23</sup> Fortunately, this disconcerting lack of C<sup>2</sup> familiarity in the RCAF has markedly improved and continues to improve each and every year because of two key efforts: continual doctrinal improvements generated through the CFAWC (e.g. emerging Air Task Force Commander Doctrine<sup>24</sup>); and a recent overhaul/redesign of the Air Force Officer Development (AFOD) program. Nevertheless, it is contended that the RCAF’s current approach towards the tenet of centralized control and

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<sup>22</sup> Allan English, "Rethinking "Centralized Command and Decentralized Execution", in *Air Force Command and Control*, eds. Douglas Erlandson and Allan English (Winnipeg, MB: Canadian Forces Training Material Production Centre, 2002), 71.

<sup>23</sup> *Ibid.*, 71.

<sup>24</sup> Department of National Defence, Canada, *Canadian Forces Aerospace Doctrine Note 14/01: Royal Canadian Air Force Air Task Force Commander Definitions, Roles, and Responsibilities* (Trenton, ON: Canadian Forces Aerospace Warfare Centre, 2014), 1 – 6.

decentralized execution, established around the JFACC/CAOC model for *all* air operations, is too centralized. To justify this comment, the aerospace tenet of centralized control and decentralized execution will be broken down into its constituent parts and individually scrutinized.

Before delving into the analysis of what the terms centralized control and decentralized execution actually mean, a brief history lesson is warranted. The developmental history of air power, specifically during both world wars, reinforced the criticality of air power being controlled by a single *Air Force* commander, resulting in two enduring truths: air power is more effective when employed holistically rather than a collection of disparate sorties or missions (penny-packs); and that centrally controlled air power can affect all three levels of war, thus the importance of maintaining a theatre wide perspective (above and beyond local objectives).<sup>25</sup>

It was also recognized that the allocation of air assets had to be centrally coordinated and prioritized due to demand always exceeding availability. Also, the exploitation of speed, reach, and elevation enabled the rapid concentration of dispersed air assets when necessary for decisive actions. Having been provided some contextual background on the

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<sup>25</sup> Royal Australian Air Force, Australian Air Publication AAP 1001.1: *Command and Control in the Royal Australian Air Force* (Tuggeranong, Australia: Air Power Development Centre, 2009), 2-2 – 2-3.

historical employment of air power, albeit very condensed, the stage has been set to analyze the concepts of centralized control and decentralized execution.

In accordance with RCAF command doctrine, centralized control is not specifically defined on its own but is described as the responsibility, executed by an ACC, for “the planning, direction, prioritization, allocation, synchronization, integration, and deconfliction of all air assets.” Secondly, the description of centralized control emphasizes maintaining a theatre-wide perspective through the ACC who has the ability to task forces to best achieve objectives.<sup>26</sup> Basically, centralized control has two aims. The first aim is to ensure the most efficient use of limited or strategic aerospace assets. The second aim is to retain the operational commander’s flexibility of assigning, monitoring, and re-assigning aerospace forces as needed, to maximize responsiveness across the full spectrum of contingencies within the battlespace.<sup>27</sup>

Noticeably absent from the meaning of centralized control is the word command. Two deductions can be drawn from this fact. Firstly, the Pigeau and McCann definition of control (discussed on page 6) is

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<sup>26</sup> Department of National Defence, Canada, B-GA-401-000/FP-001 *Canadian Forces Aerospace Command Doctrine* (Trenton: Canadian Forces Aerospace Warfare Centre Production Section, 2012), 19 – 20.

<sup>27</sup> Royal Australian Air Force, Australian Air Publication AAP 1001.1: *Command and Control in the Royal Australian Air Force* (Tuggeranong, Australia: Air Power Development Centre, 2009), 2-3.

consistent with the concept of centralized control – control enables command with respect to mission accomplishment and risk management. Secondly, the listed aerospace activities enabled by centralized control appear to be more consistent with centralized planning and direction.<sup>28</sup> To take this analysis further, it is necessary to discuss the spectrum of centralized control depicted below in Figure 2.

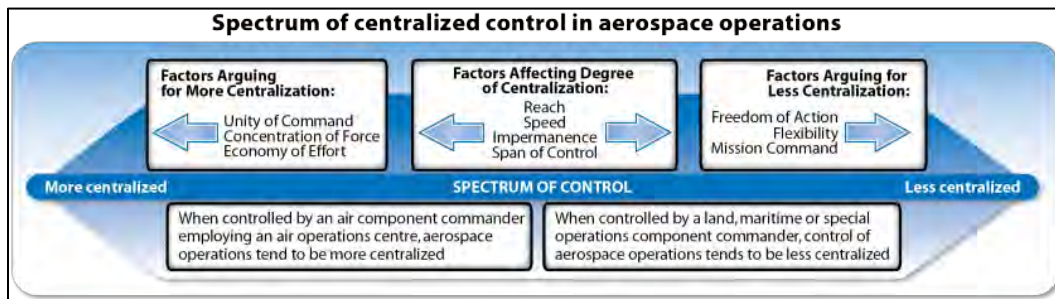


Figure 2 – Spectrum of Centralized Control in Aerospace Operations<sup>29</sup>

The spectrum of centralized control establishes that centralized control is not a zero-sum game – centralized control *or* decentralized control. In actuality, numerous factors specific to the complexity of the operational environment will determine the scope of centralized control. As a means of illustration, a highly detailed and complex fixed wing air campaign would necessitate significant centralized control maintained through the Air Tasking Order (ATO) process and a robust Theatre Air Control System (TACS). Indicative of this example would be Operation

<sup>28</sup> Mark Davis, "Centralized Control / Decentralized Execution in the Era of Forward Reach," *Joint Force Quarterly*, no. 35 (Autumn, 2004), 96.

<sup>29</sup> Department of National Defence, Canada, B-GA-401-000/FP-001 *Canadian Forces Aerospace Command Doctrine* (Trenton: Canadian Forces Aerospace Warfare Centre Production Section, 2<sup>nd</sup> Edition (DRAFT), 2014), 1-16.

MOBILE in Libya<sup>30</sup>. On the opposite end of the spectrum, towards organic control, is the operating environment of those Air Force assets typically force employed outside of the JFACC/CAOC C<sup>2</sup> architecture. Tactical aviation, integrally supporting the Army, is but one example where the rapid battle rhythm and operational tempo of the land forces require aviation assets to be placed “under their operational control rather than requesting support (which requires time) from another commander.”<sup>31</sup> The operational imperative of reduced centralized control by the RCAF, when warranted, was reinforced by CFAWC’s Project Laminar Strike stating that “tactical aviation must be 100 per cent interoperable and integrated with the land force.” Also recognized was that this concept promotes a structure that apparently can be at odds with RCAF C<sup>2</sup> methodology.<sup>32</sup>

However, the reality of the situation is that the RCAF frequently finds itself employing air power, often simultaneously, across the entire spectrum of centralized control. During Operation ATHENA<sup>33</sup>, the

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<sup>30</sup> Canada’s support to the 2011 military intervention in Libya, Wikipedia, last accessed 8 May 2014, [http://en.wikipedia.org/wiki/Operation\\_Mobile](http://en.wikipedia.org/wiki/Operation_Mobile).

<sup>31</sup> Department of National Defence, Canada, B-GA-404-000/FP-001 *Canadian Forces Aerospace Move Doctrine* (Trenton: Canadian Forces Aerospace Warfare Centre Production Section, 2011), 24.

<sup>32</sup> Department of National Defence, Canada, *Project Laminar Strike - Canada's Air Force: Post Op Athena*, eds. D. W. Lowthian and S. R. Harrison (Trenton: Canadian Forces Aerospace Warfare Centre Production Centre, 2011), 26.

<sup>33</sup> Canada’s contribution to the International Security Assistance Force (ISAF) in Afghanistan, Wikipedia, last accessed 8 May 2014, [http://en.wikipedia.org/wiki/Operation\\_Athena](http://en.wikipedia.org/wiki/Operation_Athena).

JFACC maintained operational command (OPCOM) of all strategic lift assets (high value/low density), centrally controlled through the CAOC, while the Commander of Task Force Silver Dart (deployed Air Wing HQ), held the responsibility for the direction, coordination, and control of assigned in-theatre resources. Accordingly, it is established that that the overarching purpose of centralized control is to *optimize* the employment of aerospace power strategically, operationally, and tactically. The key take-away is that the responsibilities associated with centralized control will always be executed within the RCAF chain-of-command commensurate with the appropriate delegation of authority.

Whereas the concept of centralized control is somewhat straightforward to articulate, the same cannot be said for decentralized execution. In basic terms, the purpose of decentralized execution is to mitigate the inability of centralized control to cope with the demands of modern combat. A centrally conceived and controlled plan at the operational level, no matter how detailed and comprehensive, cannot keep pace with a subordinate commander's grasp of dynamic local conditions during the execution of assigned aerospace missions.<sup>34</sup>

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<sup>34</sup> Woody Parramore, "Defining Decentralized Execution in Order to Recognize Centralized Execution," *Air & Space Power Journal* 18, no. 3 (Fall 2004), 24 – 25.



Although the intent of decentralized execution is generally understood by most airmen (and airwomen), it is difficult to coherently define as it encompasses a hodgepodge of C<sup>2</sup> concepts. The RCAF doctrinal description of decentralized execution is more of a narrative than a succinct definition:

Decentralized execution is the delegation of authority to subordinate commanders to execute assigned missions and is subject to the commander's intent, the rules of engagement, and the other parameters established by higher command. Decentralized execution fosters initiative and situational responsiveness, and provides subordinate commanders with the authority to apply their expertise and understanding of local conditions to accomplish the mission within the guidelines and overall intent of the ACC.<sup>35</sup>

Straightaway, the question is what does execution authority actually *mean*? It is evident that execution authority is meant to provide subordinate commanders the freedom of action to leverage their expertise and knowledge of local conditions in order to accomplish the assigned mission, endorsing operational flexibility. But, does it denote freedom of action to *change* the assigned mission while operating in a rapidly changing and dynamic battlespace; exploiting emerging opportunities or responding to tactical emergencies. This distinction is important because changing the assigned mission (or reprioritizing) without reference to a higher authority suggests delegation of command authority. Furthermore,

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<sup>35</sup> Department of National Defence, Canada, B-GA-401-000/FP-001 *Canadian Forces Aerospace Command Doctrine* (Trenton: Canadian Forces Aerospace Warfare Centre Production Section, 2<sup>nd</sup> Edition (DRAFT), 2014), 1-14.

the reference to the commander's intent implies an element of mission command which implies mission type orders (the *what* and not the *how*), and making on-scene decisions without referral to higher authority. Hence, it is not readily apparent on what decentralized execution *is* and *is not*.

Interestingly, searching through allied doctrine yielded similar findings with the exception of the Royal Australian Air Force (RAAF). The Australian Air Publication (AAP 1001.1) – Command and Control in the RAAF – provided a more comprehensive definition of decentralized control incorporating command authority:

Decentralised [sic] execution, enabled through the delegation of authority, direction and resources to accomplish specific tasks, enables a commander to plan and conduct operations and manage forces in a timely, efficient and effective manner without undue interference. The clear communication of an air commander's intent is very important if tactical commanders are to exploit local opportunities in accordance with the overall scheme of manoeuvre and the joint commander's theatre-wide objectives.<sup>36</sup>

The RAAF definition of decentralized execution is superior to the RCAF for numerous reasons. Firstly, it *clearly* states that the delegation of authority to a subordinate commander includes *resources* and the responsibility to *plan* and *conduct* operations at the tactical level without

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<sup>36</sup> Royal Australian Air Force, Australian Air Publication AAP 1001.1: *Command and Control in the Royal Australian Air Force* (Tuggeranong, Australia: Air Power Development Centre, 2009), 2-4.

undue interference – implies delegation of C<sup>2</sup> authority. Secondly, the definition is flexible enough to apply to Wing, Squadron, Flight, and Sub-Flight level operations – from a two-ship CF-18 close air support mission all the way to a battalion sized air assault operation commanded at the unit level. Thirdly, the implicit intent of the RAAF description of decentralized execution appears to endorse a modicum of centralized control managed at the tactical level; correspondingly dependent on the level of integration required. Fourthly, the implication of a subordinate commander being responsible for understanding the commander’s intent, two levels up, is unquestionably suggestive of a mission command mindset.

In order to enrich this discussion and better define the meaning of decentralized execution, it is now prudent to explore its antithesis, centralized execution. Remarkably, while aerospace and joint doctrine contain extensive descriptions on the benefits of decentralized execution (paired with centralized control), there exists no specific definition or mention of the term, centralized execution.<sup>37</sup> The only description found was in the RCAF command doctrine (B-GA-401) stating “centralized execution means that decisions as to the tactical execution of missions are

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<sup>37</sup> John J. Schaefer III, *Centralized Execution in the U.S. Air Force* (Kansas, USA: School of Advanced Military Studies, 2006), 2.

determined at the ACC level of command.”<sup>38</sup> An *Air and Space Power Journal* article written in 2004 stated, “Centralized execution happens if a sortie carries out its mission under direct control of an air and space operations centre (AOC)...with no other echelon in the chain of command issuing orders.”<sup>39</sup>

Despite the fact that the concept of centralized execution appears to violate the aerospace tenet of decentralized execution, it should be acknowledged that it is the appropriate means of employing aerospace power when strategic risk is paramount; thus purposely sacrificing tactical efficiency to control strategic effects.<sup>40</sup> As such, centralized execution in aerospace operations is almost identical with command-by-direction,<sup>41</sup> where the commander, enabled through technology, directs all assigned forces all the time – a centralized control and centralized execution construct.<sup>42</sup> In similar fashion to centralized control, the range of authority associated with decentralized execution can vary significantly contingent to the operating environment and its inherent risks.

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<sup>38</sup> Department of National Defence, Canada, B-GA-401-000/FP-001 *Canadian Forces Aerospace Command Doctrine* (Trenton: Canadian Forces Aerospace Warfare Centre Production Section, 2012), 20.

<sup>39</sup> Woody Parramore, "Defining Decentralized Execution in Order to Recognize Centralized Execution," *Air & Space Power Journal* 18, no. 3 (Fall, 2004), 25.

<sup>40</sup> *Ibid.*, 26.

<sup>41</sup> Czerwinski Command Framework based on three types of command style: Command-by-Direction; Command-by-Plan; and Command-by-Influence.

<sup>42</sup> Allan English, *Command and Control of Canadian Aerospace Forces: Conceptual Foundations* (Trenton, ON: Canadian Forces Aerospace Warfare Centre Production Section, 2008), 8.

To summarize this section, the primary aim of centralized control is the *optimization* of aerospace forces at the most appropriate RCAF level of command. Moreover, the overriding factor determining the *degree* of centralization is the complexity of the operation and the nature of the operating environment. With respect to decentralized execution, the aim is to enable operational flexibility during mission execution and to empower tactical commanders with decision-making ability while prosecuting the assigned mission. Importantly, the latitude of execution authority (centralization versus decentralization) is dependent on the scope of the commander's intent, operating restrictions, and the established C<sup>2</sup> relationship employed.

Therefore, as a holistic concept, centralized control and decentralized execution means efficiently prioritizing the employment of limited aerospace assets in a manner that maximizes the tactical efficiency of subordinate commanders – consistent with long-standing aerospace doctrine. Unfortunately, there is a conundrum associated with the means of realizing air power's core tenet. The problem facing air commanders is that too much “centralized control [at the operational level] restricts flexibility at the tactical level, and too much decentralized execution at the tactical level has the same effect at the operational level.”<sup>43</sup>

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<sup>43</sup> James W. Harvard, "Airmen and Mission Command," *Air & Space Power Journal* 27, no. 2 (March-April 2013), 139.

Hence, it is quite evident that the fundamental tenet of aerospace power is more than just a means to an end. It is not dogma. Instead, it is an overarching framework governing the employment of aerospace forces, and with *any* military operation, there is always a trade-off between centralized control and decentralized execution – achieving balance.<sup>44</sup> Of course, finding this balance in a joint environment is difficult and a source of tension for any Air Force. The following adage written by military historian and theorist, Liddell Hart, expresses the difficulty in achieving such a balance: “The idea of preserving a broad and balanced point of view is anathema to the mass, who crave for a slogan and detest the complexities of independent thought.”<sup>45</sup>

## **RCAF C<sup>2</sup> DESIGN – DETERMINING THE PROPER BALANCE**

1 Canadian Air Division (1 CAD), the operational level of the RCAF, institutionalized the JFACC/CAOC C<sup>2</sup> construct, for all aerospace operations during the 2005 – 2007 timeframe.<sup>46</sup> As the established C<sup>2</sup> nexus for the RCAF, the CAOC is the centralized C<sup>2</sup> system which

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<sup>44</sup> Clint Hinote, *Centralized Control and Decentralized Execution: A Catchphrase in Crisis?* (Maxwell AFB, AL, USA: Air University, Air Force Research Institute, 2009), 1.

<sup>45</sup> *Ibid.*, 1.

<sup>46</sup> Pux Barnes, *The JFACC and the CAOC-Centric RCAF: Considerations for the Employment of Air Power in Joint Operations*, Article # 2 (Trenton, ON: Canadian Forces Aerospace Warfare Centre, August 2013)

enables the JFACC to be the *focal point* of all RCAF force employment operations – consistent with aerospace doctrine.

Definitively, CFAWC acknowledged that the “role of the JFACC and indeed, much of the air operations cycle and battle rhythm of the CAOC that we [RCAF] employ today, was developed [by the US Air Force (USAF)] during Operations Desert Shield and Desert Storm.”<sup>47</sup> What is not explicitly stated is that the main functions of the USAF CAOC is to centrally control and coordinate fixed wing operations. Thus, the nature of the RCAF organization (command of *all* aerospace force) demanded that the CAOC model be superimposed over all rotary wing operations, regardless of role. As a result, the RCAF is employing a hybrid JFACC/CAOC model as the centre-of-gravity from which all aerospace operations are directed, monitored, controlled, and coordinated with other components. CFAWC, as the voice of RCAF doctrine, is furthering this message by affirming that the “JFACC and CAOC-centric” C<sup>2</sup> model is the most effective means to employ air power in support of joint/combined operations.”<sup>48</sup> In fact, except for the emerging ATF C<sup>2</sup>

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<sup>47</sup> *Ibid.*, 2.

<sup>48</sup> *Ibid.*, 6.

model, RCAF doctrine consistently depicts all flying units/detachments solely underneath an ACC.<sup>49</sup>

However, it is essential to emphasize that it is not the intent of this paper to argue against the utility of the JFACC/CAOC C<sup>2</sup> model. In fact, historical and operational evidence clearly prove that the centralization of airpower underneath a JFACC has been successful in numerous RCAF aerospace operations, domestically and internationally. Instead, the aim of this paper is to highlight that a centrally controlled *common* C<sup>2</sup> structure, based on the hierarchal ACC model, unnecessarily restricts the operational flexibility and responsiveness of air power functions that are customarily integrated with other component commands (including a delegated C<sup>2</sup> relationship). Thus, with this mindset moving forward, it is proposed that a balanced and self-aware RCAF C<sup>2</sup> enterprise must be capable of recognizing when it is appropriate to delegate C<sup>2</sup> authority over aerospace forces to another component commander, or subordinate air commander – decentralized execution accompanied with delegated decision making authority. For clarification purposes, it is highlighted that the force generation commander, Commander 1 CAD (separate from his role as the JFACC), retains residual authorities (RAs) pertaining to airworthiness

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<sup>49</sup> Department of National Defence, Canada, B-GA-401-000/FP-001 *Canadian Forces Aerospace Command Doctrine* (Trenton: Canadian Forces Aerospace Warfare Centre Production Section, 2012), 32 – 36.



(operational and technical), and flight safety. RAs are never delegated and remain outside the force employment chain-of-command.<sup>50</sup>

In his paper, *Centralized Control and Decentralized Execution: A Catchphrase in Crisis*, Lieutenant-Colonel Clint Hinote (USAF) offered a practical way of determining Air Force C<sup>2</sup> architectures appropriate to the operating environment. Following a robust study of past and present Air Force C<sup>2</sup> practices, he put forward five key questions that offer critical guidance to conceive, design and plan a balanced Air Force C<sup>2</sup> system.<sup>51</sup>

*What is the nature of the operation?* This first question requires a detailed assessment of the operating environment, the risks associated, and the anticipated aerospace capabilities to be employed. Completing the first two stages of the OPP and the applicable steps of JIPOE (Joint Intelligence Preparation of the Operational Environment) are essential requirements to answer this first question. In one situation, such as an air campaign employing lines of operation to achieve strategic and operational level objectives, a high degree of centralized control is required by the ACC. In another situation, such as tactical aviation

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<sup>50</sup> Department of National Defence, Canada, *Canadian Forces Aerospace Doctrine Note 14/01: Royal Canadian Air Force Air Task Force Commander Definitions, Roles, and Responsibilities* (Trenton, ON: Canadian Forces Aerospace Warfare Centre, 2014), 1.

<sup>51</sup> Clint Hinote, *Centralized Control and Decentralized Execution: A Catchphrase in Crisis?* (Maxwell AFB, AL, USA: Air University, Air Force Research Institute, 2009), 59 – 64.

operations in direct support of a ground commander requiring *continuous* support, a low degree of centralized control is dictated. The crucial take-away is that the diversity of RCAF functional capabilities and the nature of the operation will, *at times*, necessitate different C<sup>2</sup> approaches and relationships.<sup>52</sup>

*Where should flexibility be preserved?* This second question builds upon the first one and addresses the considerations that dictate the level of command *where* flexibility should be retained. The current political/strategic landscape and the associated tolerance for risk are two very important considerations dictating the degree of centralized decision making.<sup>53</sup> Also of importance is consideration towards whether or not it is warranted to delegate C<sup>2</sup> authority over air resources to another commander, for the purpose of tactical efficiency (e.g. OPCON to land formation commander). Worthy of mention is that *trust* plays a significant factor with this second question.

*How many assets are available?* This third question is relatively simple to answer, but nevertheless it is an important factor. Strictly considering apportionment, “the need to centralize is proportional to asset

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<sup>52</sup> James W. Harvard, "Airmen and Mission Command," *Air & Space Power Journal* 27, no. 2 (March-April 2013), 139.

<sup>53</sup> Clint Hinote, *Centralized Control and Decentralized Execution: A Catchphrase in Crisis?* (Maxwell AFB, AL, USA: Air University, Air Force Research Institute, 2009), 60 – 61.

availability and demand.”<sup>54</sup> Often, if not always, the demand of aerospace assets always exceeds availability in a joint force environment and thus it is necessary to prioritize the allocation of assets at the highest practical level to avoid dilution – especially true for high-demand / limited assets of a strategic nature. The ATO process represents the highest level of centralization for the apportionment of aerospace assets. However, apportionment of aerospace assets can occur elsewhere. During Operation ATHENA, unmanned aerial vehicles (UAVs) employed for ISR (intelligence, surveillance, reconnaissance) tasks were prioritized by the All Source Intelligence Cell (ASIC). In accordance with NATO doctrine (ATP-49), the prioritization and allocation of helicopters occurs at the Corps, Division, or Brigade level by an integrated ground/aviation agency.<sup>55</sup>

*What is the geographic range of effects?* This fourth question is specifically concerned with the operating range and speed of aerospace assets. Slow flying assets with limited range, such as rotary wing and unmanned systems, provide minimal benefit from being centrally controlled at the ACC level because they are geographically constrained to the local area of operations. In this situation, decentralization following

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<sup>54</sup> James W. Harvard, "Airmen and Mission Command," *Air & Space Power Journal* 27, no. 2 (March-April 2013), 140.

<sup>55</sup> NATO, ATP-49 *Use of Helicopters in Land Operations Doctrine*, Edition F - Version 1 (Belgium: NATO Standardization Agency, 15 October 2012), 1-7 – 1-8.

initial allocation is the best modus operandi. An example of such an arrangement was Canadian Helicopter Force – Afghanistan operating under the operational control of Regional Command – South. In contrast, there is great benefit in centralizing control over assets with theatre level and global range of flight. This permits the ACC to react to changing operational priorities and readily shift assets from one objective to another. Airlift, interceptor, and strike aircraft are examples of aerospace assets that are advantageously employed in a centralized fashion as they can operate theatre wide.<sup>56</sup>

*Who has the best situational awareness?* This is the final, and perhaps the most important question in optimizing a C<sup>2</sup> construct. The first point to consider is where in the Air Force chain-of-command (at the command level) will the highest amount of situational awareness reside. During a major air campaign, it is logical to deduce that the ACC supported by a CAOC will have a superior level of situational awareness. At the opposite end, a unit/detachment commanding officer engaged in a regionally focused tactical operation will hold the greatest level of situational awareness though his/her tactical operations centre. The second point to consider is the means and timeliness of attaining situational reports. Modern technology and a robust TACS may enable

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<sup>56</sup> Clint Hinote, *Centralized Control and Decentralized Execution: A Catchphrase in Crisis?* (Maxwell AFB, AL, USA: Air University, Air Force Research Institute, 2009), 61 – 62.

near instantaneous battlespace updates but in other circumstances, tactical level updates may be updated once every twelve to twenty four hours. The third point to consider is span of control and the ability of a C<sup>2</sup> system to efficiently monitor the dynamics of tactical level operations. Finally, the last point to consider is to determine where in the chain-of-command is it most appropriate to vest in a commander the authority to implement and monitor the operational risk management process.

The ultimate goal of the five questions is to stimulate rigorous thought by RCAF commanders and planning staff towards the operating environment *before* determining the C<sup>2</sup> architecture to be employed. Dr Allan English was accurate in his reflection on the need for adaptable C<sup>2</sup> organizations in the Air Force:

There is no “one-size fits all” C2 organization. Therefore, C2 organizations should be *designed* [emphasis added] to fit not only current circumstances, but they should also be capable of being *adapted* [emphasis added] to fit changing circumstances. It should be noted that decentralized C2 organizations, while requiring more effort and resources to develop, are more adaptable.<sup>57</sup>

Hence, it cannot be stressed enough that conceiving, designing, and implementing the right C<sup>2</sup> relationship is a critical part of the planning process. While Italian air power theorist, General Giulio Douhet, stated

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<sup>57</sup> Allan English, *Command and Control of Canadian Aerospace Forces: Conceptual Foundations* (Trenton, ON: Canadian Forces Aerospace Warfare Centre Production Section, 2008), 100.

that “flexibility is the key to air power” (a widely used Air Force catch-phrase), a suitable follow-on statement should be that flexibility is meaningless without support from an adaptable and resilient C<sup>2</sup> system.

### **AIR TASK FORCE C<sup>2</sup> FRAMEWORK**

As a learning institution, the RCAF acknowledged through its Air Force Lessons Learned Program, that its C<sup>2</sup> processes required improvement in order to avoid ad-hoc solutions as a means to mitigate gaps in its existing C<sup>2</sup> architecture. This reflection by the RCAF not only advanced its appreciation “for what C<sup>2</sup> roles and responsibilities the RCAF must fulfil during operations,” it also generated a new “RCAF C<sup>2</sup> solution” – the ATF Commander.<sup>58</sup>

An ATF is a temporary grouping of RCAF formation, squadrons, units or detachments formed specifically for force employment and given the responsibility to execute an assigned operation, mission or task. In line with the C<sup>2</sup> questions discussed previously, it is stated that “no two ATFs will look the same, owing to the diversity of [potential] operations” and that the ATF Comd, through the RCAF, must be “provided a flexible C2 solution” that permits effective command to deliver air effects.<sup>59</sup>

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<sup>58</sup> Pux Barnes, *The RCAF Air Task Force: Considerations for the Employment of Air Power in Joint Operations*, Article # 5 (Trenton, ON: Canadian Forces Aerospace Warfare Centre, March 2014), 1 – 2.

<sup>59</sup> *Ibid.*, 3.

Further evidence that the RCAF is expanding its CAOC-centric C<sup>2</sup> way of thinking can be found in CFAWC's Air Doctrine Note (ADN) 14/01 (ATF Comd) where it is now documented (draft) that air detachments can be placed underneath all component commands (Air, Land, Maritime, and Special Operations) and not just centralized underneath a JFACC/ACC.<sup>60</sup> Figure 3 below illustrates a revised C<sup>2</sup> model depicted in ADN 14/01.

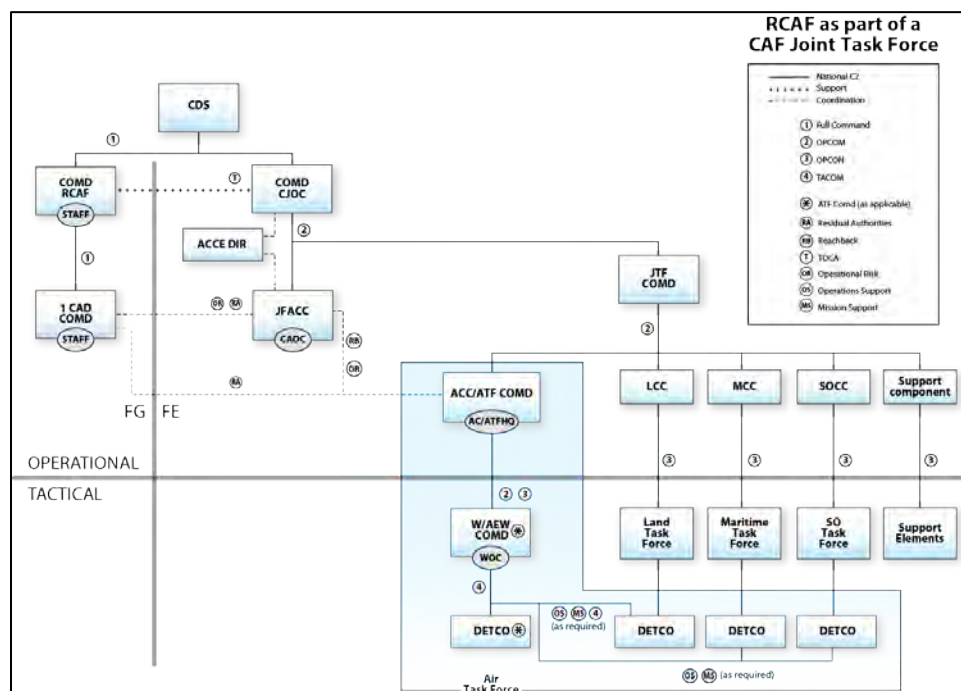


Figure 3 – Deployed ATF as Part of a CF JTF

<sup>60</sup> Department of National Defence, Canada, *Canadian Forces Aerospace Doctrine Note 14/01: Royal Canadian Air Force Air Task Force Commander Definitions, Roles, and Responsibilities* (Trenton, ON: Canadian Forces Aerospace Warfare Centre, 2014), 4 – 6.

This is a significant milestone because it recognizes that specific aerospace capabilities, such as maritime helicopters and tactical aviation, must be grouped *under* their supported element in order to achieve maximum integration of air effects. However, it must be emphasized that aerospace forces grouped under an element is not a new concept for the RCAF. Prior to the stand-up of the CAOC C<sup>2</sup> model, as it is known today, it was common practice for tactical aviation and other specialized aerospace functions to fall under their supported elemental command structure. Thus, Figure 3 represents an improved understanding of what decentralized execution entails when there is a requirement for *continuous* support.

The last hurdle remaining is for the RCAF to acknowledge that decentralized execution can also involve the delegation of formal C<sup>2</sup> authority to increase operational flexibility beyond a supported/supporting relationship. Referring back to Figure 3, it is noticeable that the aerospace detachments grouped under another component command have no depiction of a vertical command relationship. This implies that a supported component command cannot task assets directly, nor assign missions and tasks – decision making authority remains in the RCAF chain-of-command. This situation may not always be practical, depending on the nature of the mission and the level of operational flexibility required. In certain circumstances, a delegated C<sup>2</sup> authority of OPCON



(operational control) or TACOM (tactical command) may be warranted. The willingness to delegate C<sup>2</sup> authority over aerospace assets is the next institutional challenge that RCAF needs to address in order to truly embrace a force employment C<sup>2</sup> architecture that is agile, responsive, and mission focused.

Regardless, the recently developed and still maturing ATF Commander doctrine is indicative of an improving RCAF cultural awareness of balancing the trade-off required between centralized control (JFACC/ACC) and decentralized execution (customer) dependent on the functional capability employed.

## **CONCLUSION**

Purposefully focused on the RCAF's institutional challenges regarding C<sup>2</sup> doctrine, this paper contended that the RCAF C<sup>2</sup> methodology of employing the JFACC/CAOC architecture in a universal manner is unbalanced. In order to validate this statement, the discussion covered the analysis of C<sup>2</sup> theory (doctrinal and scientific) and the analytical breakdown of the master tenet of air power – centralized control and decentralized execution. The analysis demonstrated that the concepts of centralized control and decentralized execution are not absolute in practice, but instead are intended to be versatile in application.

Next, it was established that there is a trade-off relationship between centralization and decentralization and that determining the optimal balance, specific to the operating environment, is crucial to formulating an effective C<sup>2</sup> system. Ergo, when planning a C<sup>2</sup> construct for the force employment of RCAF assets, tailored to the operating environment, the fundamental task at hand is balancing the degree of centralization required versus tactical agility. In other words, a C<sup>2</sup> system must “operate at the speed of the problem” which will at times call for swift decision making at speeds “uncharacteristic of detailed or centrally controlled command systems.”<sup>61</sup>

The third section of the paper briefly introduced the CAOC-centric RCAF as means to demonstrate a predisposition towards one specific C<sup>2</sup> system. The discussion then transitioned into generating an understanding that alternate C<sup>2</sup> arrangements must be established when dictated by the operational requirement for continuous tactical support and decentralized decision making authority. It was then proposed that a balanced C<sup>2</sup> system could be realised by answering the following five questions: *What is the nature of the operation; Where should flexibility be preserved; How many assets are available; What is the geographic range of effects; and Who has the best situational awareness.* These five questions provide a

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<sup>61</sup> James W. Harvard, "Airmen and Mission Command," *Air & Space Power Journal* 27, no. 2 (March-April 2013), 143.

planning framework that shapes the development of a C<sup>2</sup> architecture specific to the battlespace and reflective of the functional capabilities employed (e.g. fighter-bombers versus tactical aviation).

Finally, the emerging ATF commander doctrine was reviewed to demonstrate that the RCAF is gravitating towards a C<sup>2</sup> organization that is both adaptable and mindful of the need for more decentralized execution. The “everything old is new again” adage comes to mind as aerospace functions customarily employed outside of the ACC’s span of control are once more moving towards their doctrinal roots. Balancing the trade-off between centralized control and decentralized execution will always be a command driven process.

A fitting statement to conclude this paper is that the RCAF must embrace a “flexibility of intellect” towards command, control, and C<sup>2</sup> if “we want to move centralized control and decentralized execution away from dogma and back to sound doctrine.”<sup>62</sup>

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<sup>62</sup> Clint Hinote, *Centralized Control and Decentralized Execution: A Catchphrase in Crisis?* (Maxwell AFB, AL, USA: Air University, Air Force Research Institute, 2009), 3.



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