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THE RIGHT TOOL FOR THE JOB? USING THE MCCANN AND PIGEAU FRAMEWORK TO UNIFY CANADIAN FORCES COMMAND AND CONTROL DOCTRINE

By / par:
Maj Alex Day
Syndicate 9
Term 3

CONTENTS

LIST OF FIGURES

LIST OF TABLES

ABSTRACT

Command and control (C2) relationships in military organizations are created based on certain principles and guidance. This guidance, embodied in doctrine, is derived from two sources. The first, lessons learned, is captured after military forces conduct operations and review their performance against tasked objectives. The second consists of academic theory that attempts to explain various phenomena with hypotheses based on conceptual foundations. Canadian Forces (CF) C2 doctrine is currently disjointed, without a coherent theme tying it together.

A new framework of C2 has been established by Canadian researchers Carol McCann and Ross Pigeau. This paper will explore the utility of using the McCann and Pigeau framework to provide a key unifying theme for CF C2 doctrine by inspecting the content of the framework itself, contrasting representative Allied and Canadian C2 doctrine, and analyzing both CF doctrine and the structure of newly-created Canada Command using the framework. It will be demonstrated that this Canadian contribution to the study of C2 can and should be used to unify CF C2 doctrine into cohesive guidance.

CHAPTER 1 - INTRODUCTION

Western societies have used the paradigm of highly centralized military organizations for well over a century.[1] With the rise in complexity of not only weapon systems but also the varied missions tasked to militaries, commanders at all levels have recently been struggling to maintain control over resources commanded by them while achieving their objectives.[2] To address this, new Command and Control (C2) structures have been developed and fielded in order to aid commanders in carrying out their tasks. Success, however, is never guaranteed in military conflict due to the nature of war, human will, and the logistical obstacles facing the quest for certainty.[3] Recently, military and academic communities have realized that it was time for a fresh look at this problem because of the inability of present-day command systems to consistently produce better results than their predecessors.[4]

On 1 February 2006 Canada Command (Canada COM) commenced operations as one of four new operational commands[5] in the Canadian Forces (CF) as a result of CF Transformation, a project initiated by the Government of Canada and reflected in the

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[1] Martin van Creveld, *Command in War* (Cambridge: Harvard University Press, 1985), 267.

[2] Examples of this include the tragic incidents involving the *USS Stark* and *USS Vincennes*.

[3] *Ibid.*, 266.

[4] *Ibid.*

[5] The others are Canadian Expeditionary Force Command (CEFCOM), Canadian Operational Support Command (CANOSCOM), and Canadian Special Operations Forces Command (CANSOFCOM).

Defence Policy Statement.[6] Designed to increase the effectiveness and efficiency of missions and tasks accomplished by CF members on behalf of the Canadian Government, the new commands represent a paradigm shift away from environmental alignment towards joint cooperation.[7]

Accompanying the creation of the new operational commands was an associated restructuring of the C2 of domestic and international CF operations. Since military doctrine is a synthesis of best practises, the reorganization of the commands, like any other task attempted by the CF, theoretically should have followed promulgated doctrinal principles and examples. This doctrine, often derived from countless years of trial and error, can also be distilled from rigorous academic investigation of proposed theories and the frameworks upon which they are based. These frameworks are, in turn, a result of concepts and hypothesis asserted to explain various observations. Therefore, the creation and organization of Canada COM should be able to trace its roots through doctrine to either academic investigation or application of lessons well-learned.

However, much of existing CF C2 doctrine, in contrast with that of other western militaries, is disjointed and lacks both prescriptive guidance on several important topics and a unifying theme that provides a coherent body of work. Portions of Canadian C2 doctrine are found in several publications including leadership and environmental doctrine; however, the bulk of the guidance is contained in joint operational doctrine.

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[6] Department of National Defence, *Canada's International Policy Statement: A Role of Pride and Influence in the World – Defence* (Ottawa: Canada Communications Group, 2005), 4.

[7] *Ibid*., 11.

As part of the renewed look at C2 discussed in the opening paragraph, Canadian researchers Carol McCann and Ross Pigeau conceived a new C2 framework in the late 1990s using a human-centered approach.[8] This framework, developed by observing Canadian operations and analyzing existing Canadian doctrine, captures recurring themes and provides a coherent approach to the discussion of C2. Derived within a Canadian context, the McCann and Pigeau framework is completely consistent with Canadian culture, national values, and military ethos and should, therefore, be used as the foundation upon which all Canadian C2 doctrine is built. This C2 framework should serve as capstone doctrine for Canadian C2 and all subordinate doctrine should be developed in reference to its principles, thereby providing the required unifying coherence throughout.

To demonstrate the utility of the McCann and Pigeau framework, this paper will focus on six areas. First, a general introduction to C2 theory will demonstrate why C2 is required and provide examples of current C2 models. Chapter Two continues with a detailed examination of the McCann and Pigeau framework and provides C2 principles based on this framework to be used in later evaluations. Second, examples of representative Allied C2 doctrine are provided in Chapter Three to demonstrate the different approaches taken to unifying doctrinal themes and specific areas for comparison to Canadian doctrine. Third, an examination of CF C2 doctrine at the joint operational, CF leadership, and environmental level is completed in Chapter Four. Chapter Five analyzes this CF C2 doctrine by first contrasting it against Allied doctrine and then

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[8] Ross Pigeau and Carol McCann, "Redefining Command and Control," in *The Human in Command*, ed. Carol McCann and Ross Pigeau, 163-184 (New York: Kluwer Academic/Plenum Publishers, 2000), 164.

comparing it to the principles espoused by the McCann and Pigeau framework. Fifth, the structure and processes of Canada COM are examined against the principles of both Canadian C2 doctrine and the McCann and Pigeau framework in Chapter Six. Finally, this paper recommends that the McCann and Pigeau framework be used as the basis upon which all CF C2 doctrine be built. This would provide a coherent approach and the ability to tie all CF C2 doctrine together under one unifying theme.

CHAPTER 2 - COMMAND AND CONTROL THEORY

Background: Why Command and Control?

Before tackling the question of what C2 theory should look like, it is necessary to understand why it is required in the first place. As noted earlier, military operations are complex and their challenges continue to grow. However, this problem is not new. Clausewitz identified it more than 150 years ago when he described how a commander required enormous will-power to overcome the many frictions that combine to prevent the realization of an objective.[9] If a commander had the ability to be instantly aware of all relevant factors within the battle-space and could communicate his will to all forces without error of transmission, he would possess a reasonable chance of succeeding in his mission. These two preconditions for success, situational awareness (SA) and communications, have been the focus of the great majority of work expended trying to improve C2. Perfect SA and communications will not guarantee success, however, since the environment in which militaries operate and future actions of enemy forces will always have an unknown quality.[10] This aspect will always require human will and decision making to be involved in the command process.[11]

However before a new C2 system or process can be developed, it must have a theoretical basis from which it can attempt to improve the status quo. There have been

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[9] Carl von Clausewitz, *On War*, ed. and trans. Michael Howard and Peter Paret (Princeton: Princeton University Press, 1976), 119.

[10] *Ibid.*, 117.

[11] *Ibid.*, 121.

volumes of work over the years attempting to provide a basis for C2 theory. Various

paradigms have been presented and subsequently refuted. Numerous topics and

acronyms appeared as each theory tried to encompass more and more of the conceptual

landscape: Command and Control (C2), Command, Control, and Communications (C3),

Command, Control, Communications, and Information (C3I), and Command, Control,

Communications, Computers, Information, Surveillance, and Reconnaissance (C4ISR)

are just a few examples. To some, these changes heralded a revolution in military

affairs.[12] Others saw it as a symptom of "command and control schizophrenia."[13]

Developers rushed to incorporate the latest technology into C2 equipment, believing that

smaller and faster components would only improve C2 systems. C2 theories were then

modified in hindsight in order to support and justify the cost of the technological

improvements while trying to ensure that the theories and models were still relevant.[14].

Current Command and Control Theory

The relevancy of these theories can be determined by conducting a scan through

a collection of books on the subject of C2. It is certain to reveal as many theories as there

are authors. Although there is no *one* theory accepted over all others, several are repeated

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[12] Thomas S. Kuhn, *The Structure of Scientific Revolutions*, 2nd ed. (Chicago: University of Chicago Press, 1970), 89-90.

[13] Ross Pigeau and Carol McCann, "Putting 'Command' back into Command and Control: The Human Perspective," *Proceedings of the Command and Control Conference*, (Ottawa, ON: Canadian Defence Preparedness Association, September 26, 1995), 1.

[14] Carol McCann and Ross Pigeau, "Clarifying the Concepts of Control and Command," *Proceedings of the 1999 Command and Control Research and Technology Symposium*, Vol. 1 (Washington, DC: CCRP, Department of Defense, 1999), 15.

often enough to be pre-eminent. For example, Martin van Creveld, in his seminal work

Command in War argues that command systems can be characterized by noting

> [t]he methods used for dealing with increasing complexity; the relative attention paid to function-related and to output related responsibilities; the emphasis laid on any given part of the command process; and the specific strengths and weaknesses displayed in relation to the ideal[15]

He goes on to classify the various actions and capabilities of command into one of three

categories: organization, procedures, or technical means based upon what function it

performs.[16]

David Alberts and Richard Hayes propose that differences in an approach to C2

can be described by three variables that combine to place it into a unique location in a C2

Approach Space. The three factors are: allocation of decision rights (from unitary to

peer-to-peer); patterns of interaction between actors (from tightly constrained to

unconstrained); and distribution of information (from broad dissemination to tight

control).[17]

Raymond Bjorklund posits that a C2 system can be evaluated on the basis of

how it contributes to establishing a shared image, controls the tempo of action, and

addresses the uncertainty of action.[18] He then selects five attributes (and 21 sub-

attributes) of an ideal C2 system from other C2 researchers (van Creveld, Dale Fincke,

Jasper Welch, Anthony Bohannon, and Wayne Hughes): dispersion (including

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[15] Van Creveld, *Command in War*, 8.

[16] *Ibid*., 10.

[17] David S. Alberts and Richard E. Hayes, *Understanding Command and Control* (n.p.), 74.

[18] Raymond C. Bjorklund, *The Dollars and Sense of Command and Control* (Washington, DC: National Defense University Press, 1995), 51.

decentralization, flexibility, and independence); invulnerability (including indeterminacy, information security, and survivability); mobility (including modularity, redundancy, self-repairability, good technical design, and homogeneity); responsiveness (including adaptability, data transformation, connectivity, decision support, direction/monitoring, knowledge maintenance, and relevancy); and timeliness (including early warning, execution time, and reliability).[19]

Thomas Coakley explains this abundance of theories by highlighting the fact that C2 exists in different contexts. Some frame the C2 debate in terminology (C2, C3, C3I, etc.), some frame it in the technological realm, others prefer to study the human context, while yet others look at it purely in terms of organization.[20] The point is that there is no accepted theory of C2. Any one could be used as a basis for evaluating C2 systems. A Canadian approach that remains relevant due to its human-centred emphasis is examined in the next section.

The McCann and Pigeau Framework

Given, then, the requirement for a C2 theory that addresses the contemporary environment, one must choose a model that will allow analysis of both doctrine and established processes and structures. Carol McCann and Ross Pigeau developed a suitable model while working at the Defence and Civil Institute of Environmental Medicine, Toronto[21]. They concentrated their work on the human side of C2 rather than

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[19] *Ibid.*, 57-66.

[20] Thomas P. Coakley, *Command and Control for War and Peace* (Washington, DC: National Defense University Press, 1992), 9-10.

[21] Now known as Defence Research & Development Canada, Toronto.

following so many others along the path of communication technologies, networks and systems.

They began their analysis with an in depth look at the differences between control and command and what properties each should have so that a consistent framework for C2 could be established. Not satisfied with accepted military definitions that seemed circular, command defined in terms of control and control defined in terms of command, they posited their own. *Command* is the creative expression of human will necessary to accomplish a given mission.[22] *Control* is the structures and processes devised by command in order to manage risk.[23] Finally, *Command and Control* is the establishment of common intent to achieve coordinated action.[24]

McCann and Pigeau's Command

The essential difference between Command and Control, argue McCann and Pigeau, is that command is described as a human attribute and control is described as a process, system, or organization.[25] They state further that there are three dimensions to differentiate capabilities in command; competency, authority, and responsibility and each of these dimensions are further divided into constituent parts.[26] The competency dimension is comprised of physical (motor skills, endurance); intellectual (knowledge,

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[22] McCann and Pigeau, "Clarifying the Concepts . . .", 5.

[23] *Ibid.*, 4.

[24] Carol McCann and Ross Pigeau, "Taking Command of C2," *Proceedings of the Second International Symposium on Command and Control Research & Technology* (Market Bosworth, UK, 1996), 3.

[25] Pigeau and McCann, "Putting 'Command' back . . .", 2.

[26] McCann and Pigeau, "Clarifying the Concepts . . .", 7.

creativity, flexibility); emotional (maturity, humour, resilience to stress); and

interpersonal (social skills based on trust, respect, empathy) measures.[27] The two

components of authority are legal (the power vested in an individual by an external

agency) and personal (the power given to an individual by peers and subordinates).[28] The

responsibility dimension comprises extrinsic (accountability as a result of legal authority

bestowed upon an individual) and intrinsic (the degree to which the individual commits to

the mission) responsibility.[29] McCann and Pigeau then define an abstract three

dimensional *Command Space* that contains all possible combinations of command ability.

Within this space lies a volume in which increased authority is matched with increased

competency, and responsibility. This range of values constitutes the Balanced Command

Envelope (BCE) that describes the optimal balance for different levels of command.[30]

Placing individuals in positions for which the necessary authority has not been

established, or using individuals that have not developed the necessary competency or

responsibility for the position, will set unbalanced conditions and may lead to command

failure.

Finally, since control cannot exist without command (i.e., command initiates

control) and command is able to modify the procedures and structures of control, McCann

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[27] *Ibid.*, 7.

[28] *Ibid.*, 8.

[29] *Ibid.*, 9.

[30] *Ibid.*

and Pigeau assert that the human-centred concept of command will always retain priority over control.[31]

McCann and Pigeau's Control

McCann and Pigeau defined control in terms of managing the risk that manifests itself within the uncertainty that surrounds the goals and objectives of a mission. For example, the risk of mission failure may be due to users of control systems not following procedures, weather remaining unpredictable, or the existence of a thinking adversary who is doing his best to prevent one's success.[32] This risk is mitigated by the structures and processes that constitute control and serve to reduce uncertainty. Structures are "sets of patterned relationships that delineate problem spaces" and processes are "sets of regulated procedures for carrying out actions."[33] There are numerous examples of control in the military. Orders, the hierarchical chain of command, organization charts, radios, and computers are all examples of structures whereas regulations, standard operating procedures, software, and doctrine are examples of processes.

Since technology can easily be applied to some of these control elements, many believe that C2 can be improved in the same manner. They believe that C2 processes can be made more efficient by incorporating automation.[34] The imposition of additional structure and process, however, comes at the cost of flexibility and innovation. Any rigid

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[31] Pigeau and McCann, "Putting 'Command' back into . . .", 11.

[32] *Ibid*., 4.

[33] *Ibid*., 5.

[34] *Ibid*., 12.

structure or rule-laden process will necessarily restrict the actions people may take in a given situation. If technology is introduced to automate the process, it only becomes more inflexible. Therefore the balance between efficiency and flexibility that control allows is tipped away from innovation with the introduction of technology.[35]

Another hazard of control concerns the assumptions and conditions under which the structures or processes were put in place. These assumptions are necessary to develop the mechanisms that control uses. For instance, designers of radios must make assumptions regarding the operating environment in which the radio will be used. Is it clean, static, dry, and interference-free? Or will the radio be used in an environment where it will be wet, dirty, subject to jamming or interference, and moved frequently? There are additional assumptions that may be more subtle. Assuming users have a common understanding of the difference between Ultra High Frequency (UHF) and Very High Frequency (VHF) transmission or that they all have hands of a given minimum size would lead to design characteristics that impact how successfully the radio will be used. Clearly a radio designed for one situation may not be well suited for the other and so it is with almost all control systems; they may be based on assumptions that are out-dated or incompatible with the current situation.[36] Therefore, control structures with poorly matched assumptions do not contribute to the reduction of risk in the mission and could, in fact, increase it.

In addition to improper control assumptions, McCann and Pigeau address some effects of over-control. For example, irrelevant control results from the disappearance of

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[35] *Ibid*.

[36] McCann and Pigeau, "Taking Command of . . .", 6.

the original purpose for the structures and processes, whereas excessive control results from a lack of room for human interaction or decision making. In the former the result is wasted time and effort that could have been better spent on worthwhile action, while the latter could result in abdication of responsibility, resignation, and loss of initiative.[37] It is for this reason that McCann and Pigeau advocate a prominent role for command in C2 systems in order to reduce the effects of over control.

Reasons for over-control are varied and complex and McCann and Pigeau offer several possibilities.[38] Firstly, control processes offer an outlet for action, and action in a military context is perceived as more desirable than indecision due to need to be part of the solution rather than the problem.[39] Secondly, the Cold War provided ample time for elaborate, complex control structures to become established. These detailed processes, coupled with increased automation provided to help offset reductions in military manpower, provide a compelling reason to abdicate human reason to prescriptive rule-following and result in excessive control.[40] Lastly, McCann and Pigeau posit that control, compared to command, is easier to articulate and, therefore, measure. Combined with the perceived need to be seen to act, this provides the opportunity for a self-sustaining cycle to be established. The need to act generates behaviour governed by control structures that are able to be measured and reported. These reports validate the actions taken and the

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[37] *Ibid.*, 7.

[38] *Ibid.*, 8.

[39] *Ibid.*

[40] *Ibid.*

process is strengthened and repeated.[41] This cycle tends to obscure the original requirement for action and commander's intent potentially leading to a loss of mission focus.

As mentioned earlier, control is able to affect command through interaction with the three dimensions of competency, authority, and responsibility. Most control structures and processes are designed to augment physical and intellectual competency.[42] For instance, longer range weapons and sensors coupled with communication systems and simulation can increase the competency of commanders if they are designed well. Conversely, poorly designed systems, or those not used as intended, could actually hinder the act of command. An example is the 'tunnel vision' encountered by pilots new to aircraft with a heads-up-display (HUD). Even though a large amount of information is now available to the pilot as he is looking outside, the overall gain is negated if the pilot forgets or refuses to look other than straight ahead through the HUD. Threats may appear from any direction but may not be noticed since the pilot is now dependent on or mesmerized by the HUD and the restricted awareness this entails. In a similar fashion, commanders may suffer a reduction in one of the dimensions of command by utilizing poorly designed control structures and procedures.

Adverse effects on the dimension of authority are more difficult to observe. Legal authority over subordinates is defined by the organizational structure, or chain of command, established. Queen's Regulations and Orders and other CF orders establishing the chain of command are examples of control structures having an effect on legal

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[41] *Ibid.*, 8-9.

[42] McCann and Pigeau, "Clarifying the Concepts . . .", 13.

authority.[43] Rules of engagement (ROE), the explicit instructions on when CF members

can resort to the legal use of force are another example. However, this structure could

have either a positive or a negative effect depending on how well a given situation

matches that contained in the structure of the assigned ROE. In a worst-case scenario,

individuals may be left without the authority to use any force other than self-defence and

may have to sacrifice mission success. This is similar to the hazard created by using

improper assumptions when designing control structures and processes. McCann and

Pigeau also note that some control processes designed to augment physical and

intellectual competency may even serve to reduce personal authority by keeping

commanders in rear areas, away from the fighting troops, where communication and

information systems are more concentrated.[44]

Legal authority to command carries an automatic extrinsic responsibility

(accountability) back up the chain of command. Control structures, therefore, also affect

the dimension of responsibility. Establishing clear terms of accountability when vesting

authority in a subordinate is one example how a control structure can affect the command

dimension of responsibility. The terms of accountability automatically generate an

extrinsic responsibility back up the chain of command. As noted earlier over-control

usually has negative repercussions on intrinsic responsibility by removing room for

human interaction and decision-making leading to resignation and loss of initiative.[45]

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[43] *Ibid.*

[44] *Ibid.*, 14.

[45] *Ibid.*

It should be apparent that the effects, outlined above, that Control structures may have on command and its application can be significant and two important factors should be recognized. Control structures and processes are able to explicitly support only half of the command components (physical and intellectual, but not emotional or interpersonal competency, legal but not personal authority, and extrinsic but not intrinsic responsibility). As well, control structures designed to augment one component may actually have a negative impact on others. As a result, McCann and Pigeau recommend that every proposed change to control be assessed against expected changes to all command components.[46]

McCann and Pigeau's Command and Control

The last concept of the McCann and Pigeau framework that requires elaboration is that of Command and Control or C2 taken together. There are two parts to their new definition of C2; one, the establishment of common intent, and two, the transformation of that intent into coordinated action. Each deserves to be examined separately.

Intent

Common intent occurs when a commander attempts to impart his will, or intent, to his subordinates. By intent, McCann and Pigeau mean the "general connotation of a specific aim or purpose."[47] They further break intent down into explicit and implicit components. Explicit intent is expressed in the direct formulation of orders and the

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[46] *Ibid.*, 15.

[47] Pigeau and McCann, "Redefining Command and . . .", 165.

communication required in transmitting an aim or purpose. Explicit intent is more common and better understood as it is used on a daily basis between people in the routine accomplishment of tasks. However, there are usually many more requirements contained within an order than just those explicitly stated. These are collectively referred to as implicit intent and make up the bulk of the general connotation being communicated by a commander. They could include concerns over how much risk a commander is willing to take, how to treat potential impacts to the environment, and what effect the operation could have if revealed to the press.

An individual's intent can be described in terms of an iceberg (see Figure 2-1), in which, explicit intent is that portion publicly communicated and the larger, unconscious implicit intent is everything that is unvocalized.[48] This hierarchy of intent is
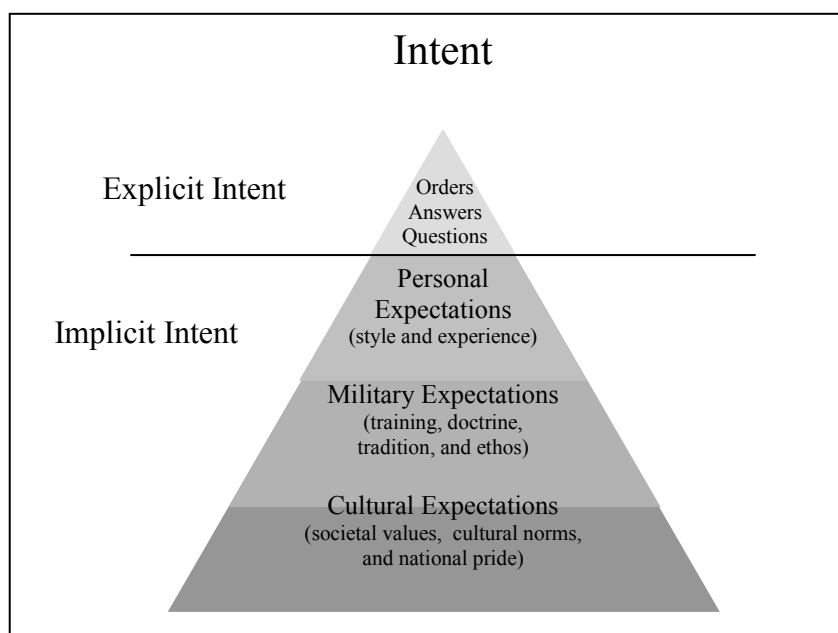
Figure 2-1: Intent Hierarchy

Source: Pigeau and McCann, *Redefining Command and Control*, 166.

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[48] *Ibid.*, 166.

important because, as depicted in the diagram, cultural expectations have a larger relative importance than military expectations, which in turn have more importance than personal expectations. At the top of the structure, explicit intent is the most visible portion, carried out based on the expectations of the layers below, each one directly influenced by the one on which it rests. Another feature of McCann and Pigeau's intent hierarchy is that people may encounter conflicting expectations between the layers. This conflict will induce stress in the individual unless the expectations are changed, with those expectations at the lowest levels the most difficult to modify.[49]

Sharing Intent

Until this point only individual intent has been examined, but to satisfy the definition of C2 intent must be shared between two or more people in order for it to become common. Sharing only explicit intent, however, will never suffice since military operations evolve in unforeseen ways and there may not exist enough time to share explicit intent in each situation. If implicit intent has been effectively shared through the prior establishment of an effective command climate while training and preparing for operations, common intent will be much easier to establish under the stress of conducting operations.[50] Therefore, commanders must continuously share implicit intent via various leadership and team-building activities.

There are several methods in which intent can be shared (see Figure 2-2). The most obvious and direct is to use verbal communications in sharing explicit intent. This

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[49] *Ibid.*, 168.

[50] *Ibid.*, 169.
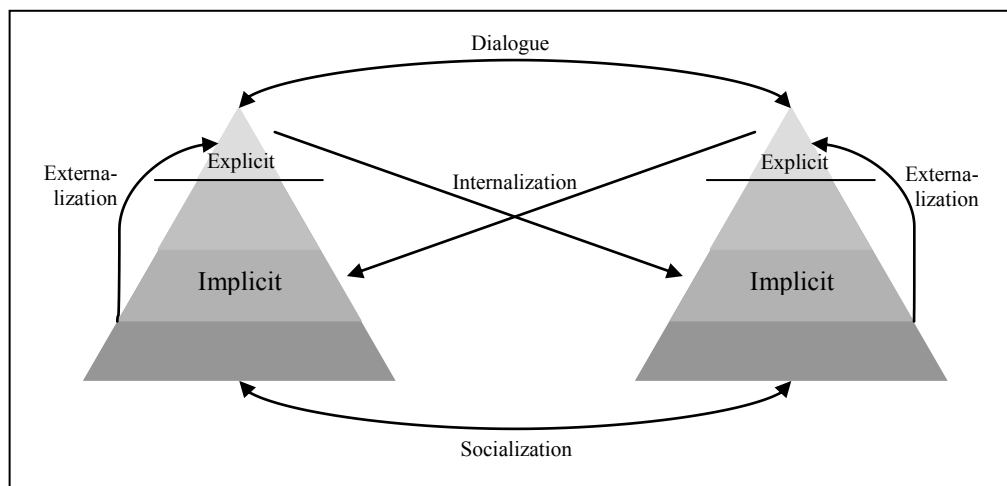
Figure 2-2: Mechanisms for Sharing Intent

Source: Pigeau and McCann, *Redefining Command and Control*, 170.

requires three conditions to be successful, a common language, a baseline level of understanding in that language, and a communication medium that will support the exchange of ideas in that language.[51] Dialogue is bidirectional since information should flow in both directions as both parties establish common intent and confirmation questions can be used to ensure common intent was established.

The sharing of implicit intent is done through socialization. Like dialogue it is also bidirectional, but is a more gradual process because a large base of knowledge about someone's expectations and values must slowly be produced through extended social contact. The contact that has the most pronounced influence on a person's subjective norms will come from those who have value and importance in a group, such as peers, supervisors, and commanders.[52] One last factor in socialization is that consistent

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[51] *Ibid.*, 168.

[52] *Ibid.*, 170.

exposure produces better results, which means that every opportunity for social contact is important in establishing implicit intent.[53]

The last two methods for sharing intent are unidirectional. Internalization is the process of transforming one person's explicit intent into the implicit intent of another. This can occur as an unconscious result of receiving written or oral directions and can be either reinforced or negated by the message being received through socialization. An individual's attempt to have others internalize a particular message will be more successful if it is supported by socialization behaviour representing the values being espoused.[54] This, of course, is a standard of good leadership and is well captured in the phrase 'actions speak louder than words'. The last method of transmission, externalization, refers to the "process through which an individual makes available her personal implicit intents – often for the purpose of transmitting them to others through dialogue."[55] This differs from dialogue since the values and concepts that the individual is trying to describe are not directly explicable. Instead, examples (metaphors and parables) are created that allow the concepts to be explored and linked to other, known, ideas.

McCann and Pigeau go on to posit that even though the four modes of sharing interact continuously, the fundamental dynamic of sharing explicit intent occurs intermittently by way of dialogue and externalization, while the sharing of implicit intent occurs almost continuously using internalization and socialization. Based on this, sharing

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[53] *Ibid.*, 173.

[54] *Ibid.*, 171.

[55] *Ibid.*

explicit intent requires a common language in which large amounts of information can be passed efficiently, whereas sharing implicit intent is "facilitated 1) by frequent and extended opportunities for verbal and non-verbal interaction, and 2) by having a rich base of experiences from which to draw."[56]

Common Intent

McCann and Pigeau's main conclusions regarding common intent, and the balance between explicit and implicit intent, have several implications for organizational structure and leadership style. For instance, there is a limit on how much intent can be made common in a given amount of time, with implicit intent requiring much longer to be comprehensively shared. Since operations are generally conducted with limited available time, there will not be enough time to conduct the socialization and internalization required for sharing the implicit intent represented by values, expectations and beliefs, particularly in joint or combined activities. Commanders must therefore compensate by emphasizing explicit intent in order to create a sufficient level of common intent amongst participants for the operation to succeed, or decide to only use a subset of his available forces, those who have the most shared implicit intent.[57]

Since shared common intent is comprised of shared explicit intent and shared implicit intent, the relative contribution of each can be used to characterize the type of organizational structure in use, either centralized or decentralized (see Figure 2-3). If most of the common intent is arrived at by sharing explicit intent, the structure will likely

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[56] *Ibid.*, 173.

[57] *Ibid.*
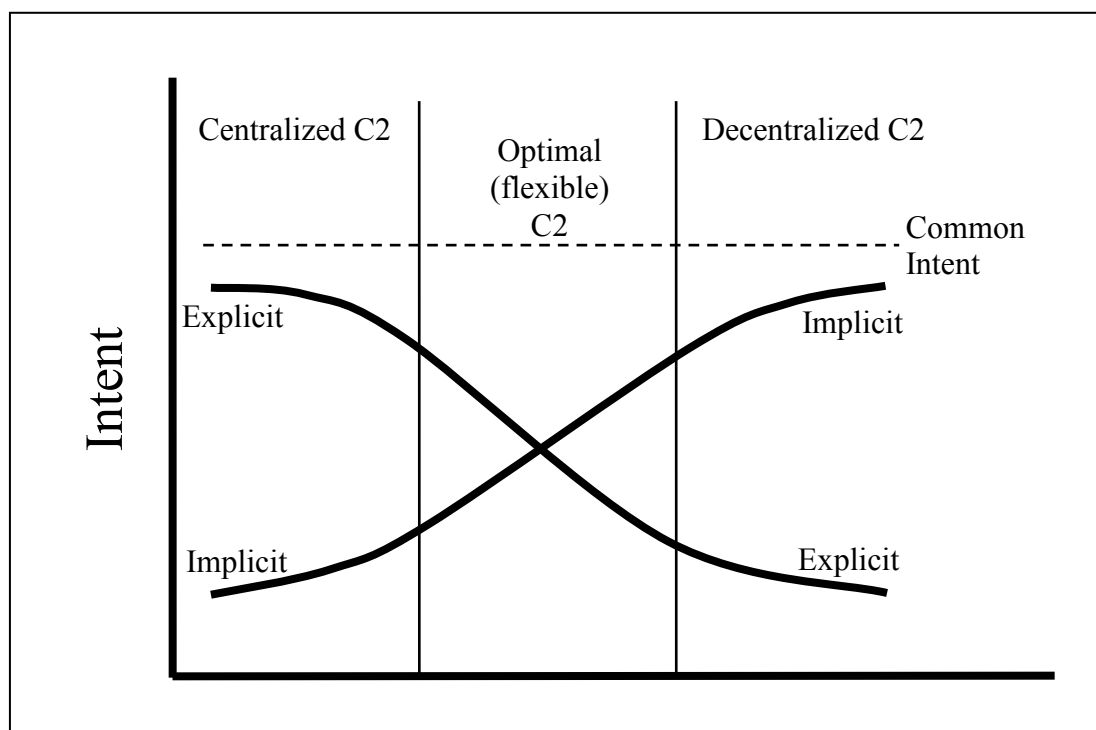
Figure 2-3: Levels of Shared Intent in Organizations

Source: Pigeau and McCann, *Redefining Command and Control*, 174.

be highly centralized. This is reminiscent of organizations such as NORAD which, over

the course of the Cold War, developed detailed chains of command and extensive

checklists and SOPs to be followed in response to hostile Soviet action. These

organizations are well suited to environments consisting of known, steady-state problems

without much complexity. Decision making in centralized organizations is kept at the

highest levels where efficient, quick reactions to well-bounded, rehearsed situations are

accomplished by carrying out procedures that detail what to do as well as how to do it.[58]

This structure is contrasted with a decentralized one in which shared common

intent is achieved mostly through socialization and internalization, creating implicit

intent. This type of organization is predisposed to situations that are ill defined, rapidly

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[58] *Ibid.*, 174.

changing and chaotic. Once again using the NORAD analogy, this was the type of

situation faced on 9/11 when new threats from previously unthinkable origins made

themselves known. To become effective, decision making is spread down to the lower

levels of the chain of command where individuals use their situational awareness and

shared implicit intent to achieve mission goals. Rules and procedures are generally more

flexible, usually detailing only what has to be done but not how.[59] This type of

organization is frequently described, depending on the context, using terms like 'mission

command,' 'auftragstaktik,' and the 'strategic corporal,'[60] however, these words are of

limited utility in describing the relationship between centralization and common intent

that is depicted in Figure 2-3.

Common Intent and Leadership

McCann and Pigeau introduce leadership as the means by which a leader

interacts with others in order to accomplish an objective.[61] Various leadership strategies

can then be described by plotting them along a continuum emphasizing the social-

psychological distance between leader and follower (see Figure 2-4). At one end of the

spectrum is the autocratic leader that stands aloof from subordinates and establishes

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[59] *Ibid.*, 175.

[60] 'Mission Command' is a philosophy that enables subordinates to determine their own best method of meeting the commander's intent and is further discussed in Chapters 3 and 4. 'Auftragstaktik' is a similar concept in which subordinates are told what to do, not how to do it. 'Strategic corporal' refers to the strategic effect that junior tactical subordinates can have while conducting missions in a decentralized environment.

[61] *Ibid.*, 177.

common intent purely by explicit intent. This leader does not even try to create common implicit intent within his followers.[62]

At the other end of the spectrum is the charismatic, or transformational, leader. These leaders have several characteristics that distinguish them from others including expressive behaviour, self-confidence, self-determination, insight, freedom from internal conflict, eloquence, high activity and energy level, and followers who identify with them.[63] The key characteristic is freedom from internal conflict. Followers are motivated to adopt the charismatic leader's vision in an attempt to reduce the chronic internal conflicts within their own intent hierarchy.[64] Thus the process of socialization ensures

Figure 2-4: Leadership Styles

Source: Pigeau and McCann, *Redefining Command and Control*, 178.

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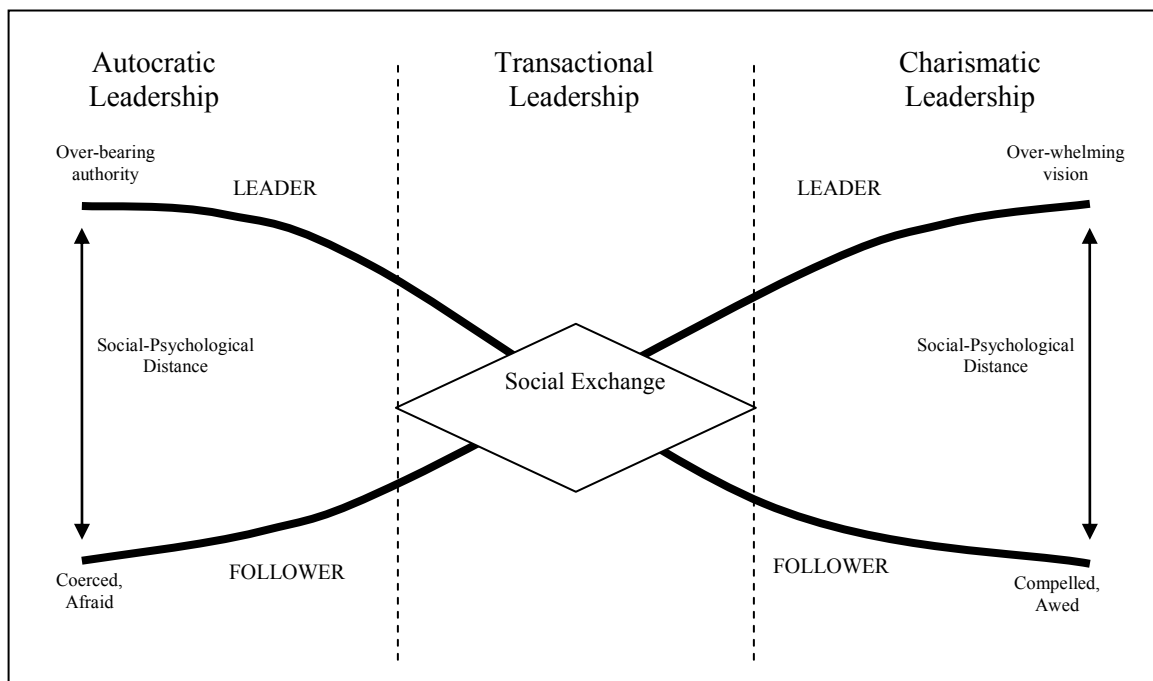
[62] *Ibid.*, 178.

[63] *Ibid.*, 179.

[64] *Ibid.*

complete common implicit intent but social-psychological distance is maintained due to the compelling, awed image followers have of the leader.[65]

McCann and Pigeau focus, however, in the central region of the leadership spectrum, termed transactional leadership. Here, the "dominant emphasis is social exchange" and a "key element in the concept . . . is mutual fulfillment. . . ."[66] The various needs that are exchanged, of both leader and follower, could be concrete commodities or abstract social influences. Many of these are not completely conscious and this fits nicely with McCann and Pigeau's model of subconscious sharing of implicit intent.[67] They then use this context of social exchange to provide a new definition of leadership in C2: "the act of resolving intrapersonal and interpersonal conflicts for the purpose of achieving common intent."[68]

Achieving Coordinated Action

Recall that McCann and Pigeau's definition of C2 required the establishment of common intent to achieve coordinated action. They further define coordinated action as "the proper arrangement of resources and effort, both in time and space, to harmonize intended mission effects."[69] In general, they assert that there are two contrasting approaches to achieving coordinating action. The first is accomplished by using the tools

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[65] *Ibid.*, 179-180.

[66] *Ibid.*, 180.

[67] *Ibid.*

[68] *Ibid.*, 181.

[69] Ross Pigeau and Carol McCann, "Establishing Common Intent: The Key to Co-ordinated Military Action," in *The Operational Art: Canadian Perspectives – Leadership and Command*, ed. Allan English, 85-108 (Kingston: Canadian Defence Academy Press, 2006), 86.

of explicit intent to create explicit control structures and processes. The second is a more hands-off approach allowing spontaneous behaviour to emerge that, hopefully, will be consistent with mission objectives.[70]

McCann and Pigeau model the achievement of coordinated action by proposing that the infinite number of solutions to open-ended problems (such as those presented during military missions) exist in a theoretical problem space. If restrictions can be placed on the desired nature of the coordinated action, the number of available solutions becomes bounded. McCann and Pigeau argue that the CF accomplishes this by promulgating principles, such as the Canadian military values described in *Duty with Honour: The Profession of Arms in Canada*.[71] An example of the infinite solution space divided into acceptable and unacceptable regions using the principles of legal, professional, and ethical behaviour is shown at Figure 2-5.

The problem for a commander then becomes a question of how much effort he should expend in making his intent explicit in order to bound the space of acceptable solutions.[72] McCann and Pigeau propose that three factors will contribute to solving this problem. The first is the amount of explicit and tacit knowledge shared by subordinates.[73] The degree of explicit knowledge understood by subordinates indicates that they know what to do. The degree of their tacit knowledge puts bounds on the solution space; it tells them what not to do:

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[70] *Ibid.*, 87.

[71] *Ibid.*, 93.

[72] *Ibid.*, 96.

[73] *Ibid.*, 97.
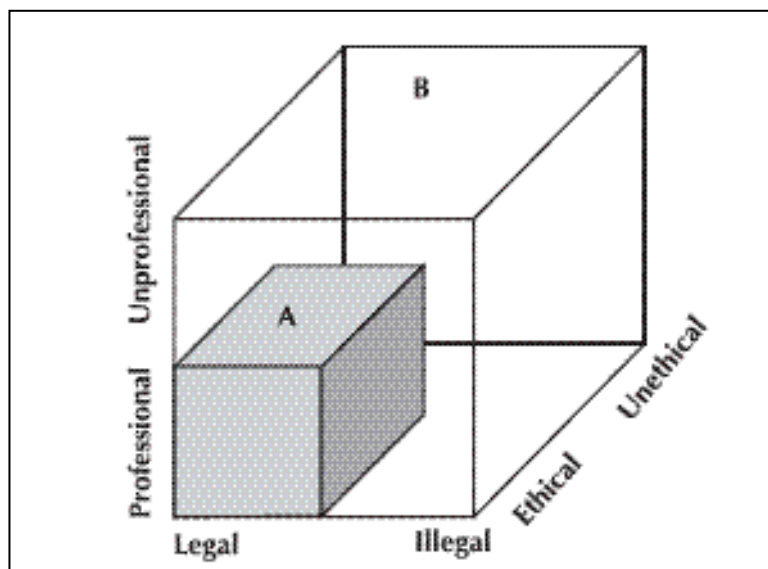
Figure 2-5: Infinite Solution Space

Source: Pigeau and McCann, "Establishing Common Intent. . . ," 93.

> In other words, if commanders are not confident that their subordinates' solution spaces are sufficiently well bounded, then they will not be confident that spontaneous, acceptable, co-ordinated behaviour will emerge in their absence. Commanders, therefore, must continually assess both the level of overt knowledge about the mission and the level of tacit knowledge about guiding principles that subordinates share for interpreting intent.[74]

The second factor is the level of reasoning ability of subordinates. Coordinated action depends on the ability of subordinates to make decisions and initiate action.[75] Since subordinates could come from different ranks, different levels of education, different services, or different countries, commanders must continually evaluate this ability. McCann and Pigeau propose three strategies to accomplish this:

> First, commanders should identify, as soon as possible, those individuals who demonstrate a competence for thinking a problem through. These individuals should occupy key roles in the commander's team. Second, commanders should match the difficulty of the task to the intellectual ability of the member. . . . Third, commanders should ensure that subordinate commanders engage in

[74] *Ibid.*

[75] *Ibid.*, 98.

similar kinds of strategies — that is, carefully choose their teams and allocate tasks according to competence.[76]

The last factor involved in the balance between explicit and implicit intent is the level of subordinates motivation and commitment to achieve mission objectives.[77] Commanders should pay close attention to issues of unit morale and esprit de corps while energizing subordinates towards spontaneous coordinated action.[78] In this manner, McCann and Pigeau extol the virtues of leadership and its necessity in successful C2.

By careful management of these three factors, McCann and Pigeau assert that a commander "can take full advantage of the potential for common intent that resides in his or her subordinates."[79] Commanders may also determine the impact on C2 that a particular combination of the three factors will produce. Table 2-1 displays this impact as a function of the eight possible combinations of the factors being either maximized or minimized.

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[76] *Ibid.,* 100.

[77] *Ibid.*

[78] *Ibid.,* 101.

[79] *Ibid.,* 105.

Table 2-1 Achieving Common Intent Among Subordinates

Shared Knowledge	Comparable Reasoning Ability	Shared Commitment and Motivation	Impact on C2
Maximum	Maximum	Maximum	Greatest potential for establishing common intent
Maximum	Maximum	Minimum	Wasted potential for common intent (leadership issue)
Maximum	Minimum	Maximum	Some potential for common intent; will need to rely on very detailed plans and explanations
Maximum	Minimum	Minimum	Poor potential for common intent; leadership and detailed plans required
Minimum	Maximum	Maximum	Good potential for common intent if guiding principles for appropriate action exist (means more effort needed for explicating objective); if shared guiding principles do not exist, unacceptable solutions are a possibility
Minimum	Maximum	Minimum	Little potential for common intent; leadership and very detailed, explicit intent are required
Minimum	Minimum	Maximum	Dangerous common intent; over zealousness may lead to unco-ordinated chaos with high potential for unacceptable solutions
Minimum	Minimum	Minimum	Least potential for establishing common intent

Source: Pigeau and McCann, "Establishing Common Intent . . . ," 106.

Conclusion

Command and control theory has been developed to aid commanders to reduce

Clausewitz's 'friction' in military operations. Many researchers have contributed

numerous models of C2 but the expected gains in performance have not materialized.

This may be a result of the confusing landscape of C2 theory or the reactive nature of

theory development as a result of the tempo of technological change. Having now

examined the new human-centered framework for C2 espoused by McCann and Pigeau, a

set of propositions can be derived for further use in the evaluation of both CF C2 doctrine and organizational structure. These propositions are summarized here:

- Command consists of the creative expression of human will

- Control consists of those structures and processes devised by command to manage risk

- C2 must establish common intent in order to achieve coordinated action

- Command has priority over control

- Explicit intent is better understood if combined with shared implicit intent

- A principle responsibility of command is to develop shared implicit intent to enable quick establishment of common intent for a mission

- C2 may fail if control systems are too complex and inflexible to serve the range of operations expected

- Over-control is a result of irrelevant procedures or complete automation and causes either wasted time and effort or complacency and loss of initiative

- Establishing the shared military expectations of implicit intent is accomplished by continuous exposure to the organizational values of the military

- Sharing explicit intent requires proficiency in a common language with a capability to efficiently transmit large amounts of information

- Centralized C2 requires more shared explicit intent than implicit intent and is tailored towards well-bounded stable operations

- Decentralized C2 requires more shared implicit intent than explicit intent and is tailored towards ill-defined, unfamiliar, and rapidly changing operations

- Control structures must facilitate the BCE dimensions of competency, authority, and responsibility

- Transactional leadership resolves intrapersonal and interpersonal conflicts via explicit and implicit social exchange for the purpose of achieving common intent

- Coordinated action is achieved by balancing the composition of explicit and implicit intent

- The correct balance between explicit and implicit intent depends on subordinates':

    o Shared explicit and tacit knowledge

    o Ability to reason

    o Level of motivation and commitment to achieve the objective

CHAPTER 3 - ALLIED COMMAND AND CONTROL DOCTRINE

Doctrine is developed to provide "fundamental principles by which the military forces guide their actions in support of objectives. It is authoritative but requires judgement in application."[80] Its purpose is to support military planning by offering best practices, procedures, structures, instructions, and techniques to achieve objectives. Doctrine should not provide mandatory methods of accomplishing tasks but, as suggested by the definition, should clearly articulate those practices that developed over time have proven to be enduring in their ability to achieve a successful outcome.

There are numerous levels of doctrine; most militaries have joint and single-service doctrine that provides guidance at the strategic, operational, and tactical level. Alliances also produce doctrine to provide guidelines for member countries to work more efficiently and effectively together. At the strategic level, most western nations have evolved similar doctrine, only differing in those aspects each nation prefers to emphasize such as unique C2 arrangements. This similarity helps combined forces work effectively together, even if no formal alliance exists to provide explicit guidance.

United States Command and Control Doctrine

US doctrine is well formulated, accessible, and logically arranged in a hierarchy that provides successively increasing amounts of detail and guidance from the strategic to the tactical level. Extensive US joint doctrine is available at the strategic and operational

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[80] Department of National Defence, A-AE-025-000/FP-001 *Canadian Forces Doctrine Development* (Ottawa: DND Canada, 2003), 1-3.

levels and environmental doctrine from the strategic to the tactical (tactics, techniques, and procedures) levels.

US C2 doctrine is articulated in several publications and is consistent throughout this joint hierarchy. The main ideas of US joint C2 doctrine are introduced in capstone doctrine documents *Joint Publication 1 Joint Warfare of the Armed Forces of the United States* and discussed in depth in *Joint Publication 0-2 Unified Action Armed Forces (UNAAF)*. The main C2 concepts presented in these publications outline the types of command, levels of command authority, principles of C2, C2 of multinational operations, and organization of joint forces. Throughout the doctrine the overarching concept of Unified Action by military commanders is presented as supporting a whole-of-government Unity of Effort designed to achieve national strategic objectives. Unified Action refers to the broad range of synchronizing actions taken by commanders at all levels to ensure operations are in support of common goals. This concept has much in common with that of common intent. Since it is introduced at the very highest level of doctrine, there is a good chance that it will be internalized by all commanders through repeated exposure and socialization. This aids US commanders in accomplishing their objectives by establishing the doctrinal concept of Unified Action as shared common intent.[81]

The doctrine proscribes how US military forces are arranged for both operations in support of missions and when not assigned in support of missions. These two broad areas of organization provide structure for all US military forces. When forces are not

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[81] United States, Department of Defense, *Joint Publication 0-2 Unified Action Armed Forces (UNAAF)* (Washington, DC: US Government Printing Office, 10 July 2001), I-5.

assigned to a certain mission, they are under command of their parent service, such as the Air Force or Navy. When carrying out operations in support of a mission, military forces are under command of a combatant commander, such as the Commander US Central Command, who conducts missions in North-East Africa, the Middle East, and South-West Asia.[82] The combatant commanders, specified in the Unified Command Plan, are either commanders of unified or specified commands, the difference being whether the command contains forces from more than one service or not. This assignment along either a service or combatant chain of command provides clear direction to military forces about the objectives of their current mission. It also provides the combatant commanders the authority required to achieve their assigned missions.[83]

There are four command relationships established by doctrine in *UNAAF*. These consist of Combatant Command (used as a command authority; also COCOM), Operational Control (OPCON), Tactical Control (TACON), and Support. The nested arrangement and major responsibilities of these relationships are shown in Figure 3-1. The supporting command authorities are Administrative Control (ADCON), Coordinating Authority, and Direct Liaison Authorized (DIRLAUTH).

COCOM can only be exercised by a combatant commander and involves "organizing and employing commands and forces, assigning tasks, designating objectives, and giving authoritative direction over all aspects of military operations, joint training . . . and logistics necessary to accomplish the missions assigned to the command."[84] This is

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[82] *Ibid*., I-9

[83] *Ibid*., I-8.

[84] *Ibid*., III-3, III-4.

Figure 3-1: Command Relationships

Source: US, Department of Defense, *JP 0-2 Unified Action Armed Forces*, III-2.

the broadest level of command authority and is short of full command only in that it does not contain ADCON. COCOM also carries the authority to delegate OPCON of subordinate forces.

OPCON has the same implications for US forces as it does for other militaries. OPCON gives subordinate commanders the authority to organize and employ forces, assign tasks, designate objectives and give authoritative direction on all aspects of military operations and joint training necessary to accomplish a mission.[85] It is the level of authority most often delegated to subordinate unified commanders and joint task force

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[85] *Ibid*., III-7.

commanders in order to plan and execute operations in support of assigned missions. OPCON differs from COCOM in that it does not include the authority to provide direction in matters of logistics, administration, discipline, internal organization, or unit training.[86] It does include the authority to delegate OPCON or TACON.

TACON is the authority to provide the detailed direction and control of military forces within a specified operational area in support of assigned missions or tasks.[87] Once again this definition is in line with Allied military use of the term. TACON does not include the authority to organize forces or provide administrative or logistical support. It is frequently assigned to joint task force component commanders.[88]

The final type of command relationship is that of Support. The supported/supporting relationship provides direction to forces or commands to "aid, protect, complement, or sustain another force."[89] This relationship is extremely useful in designating the command or force to be supported (in other words the main effort) for particular phases of an operation without re-assigning forces within a chain of command. The supported commander is responsible to establish targets and priorities to accomplish the task or mission and the supporting commander is responsible to determine how he will provide the required support. This arrangement provides clear direction on which objectives are to receive priority during planning and execution.[90]

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[86] *Ibid*.

[87] *Ibid*., III-8.

[88] *Ibid*.

[89] *Ibid*., III-9.

[90] *Ibid*.

The three supporting command authorities (administrative control, coordinating authority, and direct liaison authorized) are required for providing administrative support to, and coordination between, military forces. Administrative Control, ADCON, is that authority vested in a commander to provide administration and unit logistical support to military forces. This includes personnel administration, individual and unit training, discipline, and other matters not included in the operational missions of the supported military forces.[91] Coordinating Authority identifies a commander or individual responsible for coordinating activities between two or more forces, departments, organizations, or services.[92] It is used to specify a commander who will lead the effort during the activity. Coordinating Authority is most often used during planning and while it can be used to require consultation between parties, it does not carry the authority to compel agreement.[93] The final authority that can be granted is Direct Liaison Authorised, or DIRLAUTH. This authority, once granted by a commander, allows a subordinate to coordinate with agencies or organizations outside of his command.[94] Like Coordinating Authority, DIRLAUTH is mainly used in planning activities and does not confer any command authority.

These command relationships and supporting command authorities are used to create Unity of Effort in the achievement of a mission. The COCOM, OPCON, and TACON relationships ensure each and every commander in the chain of command knows

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[91] *Ibid.*, III-11.

[92] *Ibid.*

[93] *Ibid.*

[94] *Ibid.*, III-12.

the degree of authority he or she has over forces under his or her command, whereas the supported/supporting relationships along with administrative and coordinating authorities give direction on who is responsible to provide operational and administrative support to whom. These roles are well explained in US doctrine and ensure that each commander understands attendant responsibilities.

C2 theory, including definitions and tenets, is the third major area of US C2 doctrine that must be examined. The US definition of C2 is ". . . [t]he exercise of authority and direction by a properly designated commander over assigned and attached forces in the accomplishment of the mission."[95] This definition is constructed from the individual definitions of 'command' and 'control' but leaves out the important concept of acting "in accordance with the commander's intent," which is contained in the definition of control.[96] This is an important omission as it allows one to focus on the systems or processes of C2 without emphasis being placed on establishing an understanding of commander's intent. Consequently, there is a risk of concentrating effort on design of C2 systems while ignoring the more important concept of ensuring subordinates understand commander's intent. Despite this shortcoming, the explanation of the purpose of C2 is clear: "C2 is the means by which a [commander] synchronizes and/or integrates joint force activities in order to achieve unity of command and unity of effort."[97] This unambiguous explanation of the goal of C2 is supported by a list of tenets and principles that provide further guidance on what factors impact C2 capability. This list is

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[95] *Ibid.*, GL-5.

[96] *Ibid.*, III-13.

[97] *Ibid.*

comprehensive and runs the gamut from Decentralized Execution through to Interoperability.

Decentralized Execution. Combined with centralized planning, decentralized execution provides the ability to maintain unity of effort during complex operations. This tenet must continuously be kept in mind throughout the chain of command due to the ability of senior-level, centralized, commanders to be aware of and influence events at the tactical level. This potential is due to the increased situational awareness made possible by advances in technology. The degree of decentralization at a given moment will depend on several factors such as type of operation, risk level, and comfort of the commander.[98]

Clearly Defined Authorities, Roles, and Relationships. Appropriate command relationships, clear definition of supported/supporting relationships and delegation of supporting authorities as described earlier ensures that the chain of command is clearly outlined and suitable for the mission. If appropriate relationships have been established subordinate commanders understand their responsibilities and decentralized execution is possible, while ensuring the superior commander retains the requisite amount of control.[99]

Information Management. Successful accomplishment of operations requires timely decisions that rely on effective collection, transmission, and interpretation of information. The commander's critical information requirements (CCIR), a plan for the

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[98] *Ibid.*, III-13, III-14.

[99] *Ibid.*, III-14.

management of that information, and the information systems required, must be all be established and understood.[100]

Implicit Communication. This concept is very similar to McCann and Pigeau's concept of common intent. According to US doctrine, common understanding between commander and subordinate is required to minimize restrictive control measures. This removes limitations on how a subordinate should accomplish a mission, establishing only what needs to be done. Implicit communication is enabled by the use of commander's intent, which gives overarching guidance on the desired outcome, and mission-type orders that specify what is to be accomplished rather than the methods to be used. This ensures subordinates are free to modify their actions in response to a changing situation.[101]

Timely Decision-making. This tenet refers to the need for decision-making models, procedures and decision aids that help a commander establish a faster tempo of operations. This quicker tempo will require the adversary to react continuously, removing his ability to seize the initiative, and generate a military advantage for the friendly commander.[102]

Robust Integration, Synchronization, and Coordination Mechanisms. The maintenance of effective communications in joint, multinational, or interagency operations is necessary to permit a commander to maintain situational awareness. These

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[100] *Ibid*.

[101] *Ibid*., III-14, III-15.

[102] *Ibid*., III-15.

mechanisms, established between other forces, countries, or agencies, ensure unity of

effort towards achieving the objective.[103]

Battle Rhythm Discipline. Battle rhythm refers to the daily sequence of events at

a commander's headquarters that are necessary to plan, conduct, and evaluate operations.

Establishing, and following an effective battle rhythm will aid a commander's decision

process by ensuring relevant information is presented to him in an efficient manner at the

proper time. Technology, such as video teleconferencing, provides methods to simplify

this presentation of information. Particular attention should be paid to the 'battle

rhythms' of subordinate and superior headquarters to ensure efficient internal and

external communication.[104]

Responsive, Interoperable Support Systems. All C2 systems must be able to

respond quickly to changes in the situation. Coupled with the ability to react in near real

time, the capability to interact with systems from other forces, nations, and agencies will

enhance a commander's situational awareness and increase the probability of conducting

successful operations.[105]

Situational Awareness. The ability of a commander to make timely, correct

decisions is based on the quality of the information provided to him. Knowledge of own

and adversary force dispositions, intentions, and capabilities allows a commander to

direct his forces appropriately towards mission objectives.[106]

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[103] *Ibid.*

[104] *Ibid.*, III-15, III-16.

[105] *Ibid.*, III-16.

[106] *Ibid.*

Mutual Trust. For decentralized execution of operations to function, a commander must be able to trust his subordinate forces. Likewise, subordinate forces must trust that a commander will use those assigned forces in the manner for which they were trained. Mutual trust allows commanders at all levels to exploit opportunities created by a changing operational situation. It is gained by demonstrating competence and repeated opportunities to train together.[107]

Simplicity. The overarching goals of unity of command and unity of effort are achieved by establishing an unambiguous chain of command, well-defined command relationships, and expressing clearly authorities and responsibilities.[108]

Span of Control. A single commander must limit the number of subordinate forces in his direct chain of command to ensure proper attention can be directed towards the complex problems of contemporary military operations. The extent of a commander's span of control is based on factors such as number of subordinate forces, size of the operational area, complexity of the mission, and degree of centralization of the C2 system.[109]

Unit Integrity. Military forces are formed and trained as cohesive units in order to promote unity of effort. Breaking a military unit into subordinate parts must be done only after careful consideration of the possible ramifications that action may have on unit effectiveness.[110]

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[107] *Ibid*.

[108] *Ibid*., III-17.

[109] *Ibid*.

[110] *Ibid*.

Interoperability. This tenet emphasizes that unless subordinate forces are able to communicate and operate together, a commander will not be able to achieve unity of effort. Interoperability applies to all facets of operations, from language, C2 systems, training, logistic support, and doctrine.[111]

The preceding principles and tenets are used throughout US joint doctrine to ensure that commanders are provided the guidance required to promote the unity of effort needed for successful operations. Further direction is specified in the area of multinational operations during which US forces may be placed under command of foreign commanders.

UNAAF introduces, and *Joint Publication 3-16 Multinational Operations* refines, several factors involved in organizing multinational forces including the implications of assigning forces under the various command authorities. Interestingly, the doctrine states: "In many cases, coordinating authority may be the only acceptable means of accomplishing a multinational mission."[112]

Multinational Operations provides three examples of different command structures that may be established. The first of these is an integrated command structure in which both the headquarters and subordinate components are composed of combined forces from participating nations.[113] NATO provides a good example of an integrated command structure. The second, a lead nation command structure, exists if contributing nations keep their forces under command of a national commander who reports to a

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[111] *Ibid*., III-18.

[112] United States, Department of Defense, *Joint Publication 3-16 Multinational Operations* (Washington, DC: US Government Printing Office, 7 March 2007), II-5.

[113] *Ibid*., II-6.

multinational commander and staff provided by a lead nation.[114] An example of this structure is the International Security Assistance Force (ISAF) in Afghanistan. The third type of structure is characterized by the lack of a single designated multinational commander. Individual nations maintain forces under national command and unity of effort is achieved by extensive coordination carried out by national force commanders.[115]

Coordination and unity of effort for all three structures is enhanced by establishing liaison networks and coordination centres.[116] The type of structure established will affect the degree of centralized control and coordination that may be exercised over operations. More control can be exercised in an integrated structure such as an alliance due to well-defined command relationships, whereas less control may be available for the parallel structure of an ad hoc coalition due to the reluctance of nations to release command of their forces.[117] All of these factors must be considered when contributing forces to multinational operations.

The final chapter of *UNAAF* contains guidance on establishing the various types of joint force organizations required for operations (see Figure 3-2). In general, US joint forces are created either at the unified (or specified), subordinate unified, or joint task force (JTF) level. A unified (or specified) joint force is established if there exists a broad, continuing mission, large-scale operations requiring a complex force, or operations requiring coordination over large geographical or functional areas. This would be at the

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[114] *Ibid*.

[115] *Ibid*., II-7.

[116] *Ibid*., II-10.

[117] *Ibid*., II-12.
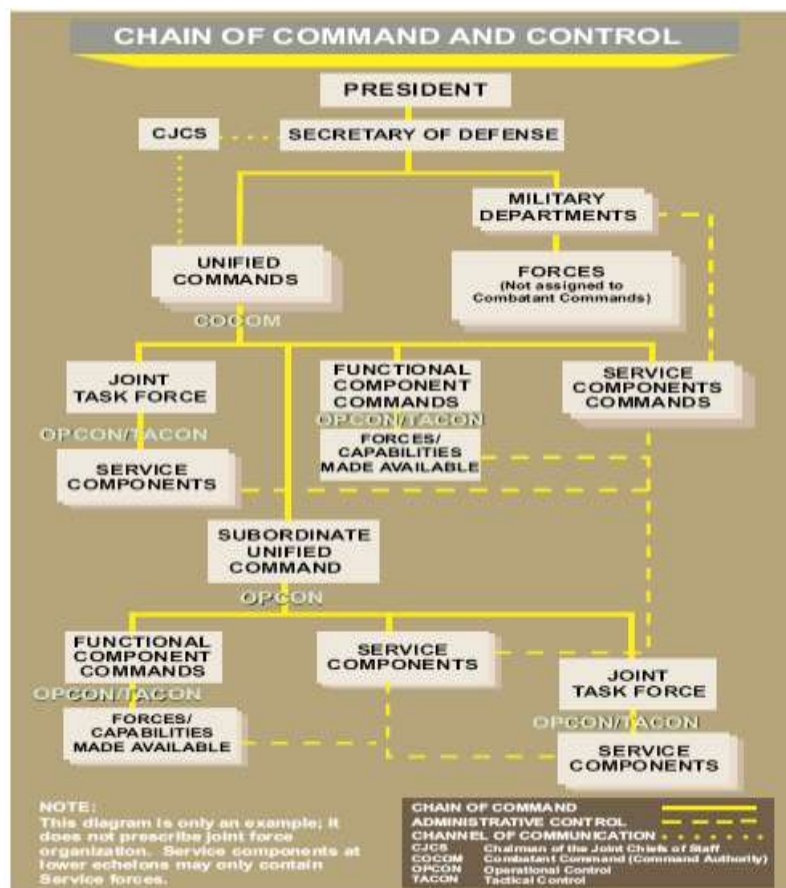
Figure 3-2: Chain of Command and Control

Source: US, Department of Defense, *JP 0-2 Unified Action Armed Forces*, I-7.

combatant command-level. The joint force is unified if significant forces from two or more services are required; otherwise, it is specified.[118] A unified commander may establish subordinate unified joint forces for continuing missions within his geographic or functional area of responsibility.[119] A JTF is established when "the mission has a specific limited objective and does not require overall centralized control of logistics."[120]

Regardless of the level, a joint force will contain service components (to provide

[118] US, DoD, *JP 0-2*, V-6, V-8.

[119] *Ibid.*, V-9.

[120] *Ibid.*, V-10.
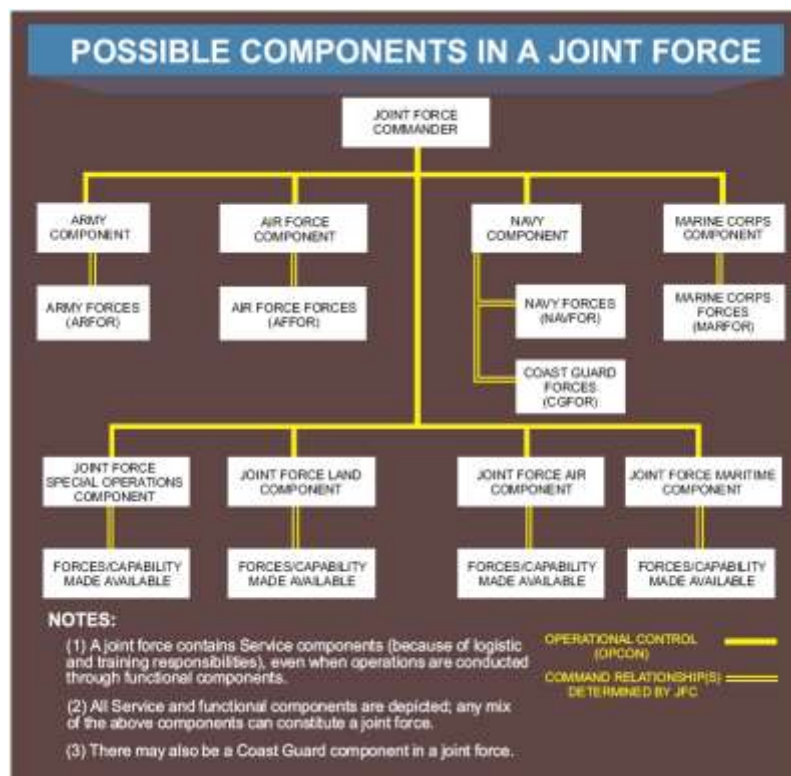
Figure 3-3: Components of a Joint Force

Source: US, Department of Defense, *JP 0-2 Unified Action Armed Forces*, V-3.

administrative and logistical support), and may contain functional components, or a

combination of the two (see Figure 3-3)[121]. Joint forces may be organized on either a

geographical or a functional basis. For example, the geographic commands are US

Northern Command, US Pacific Command, US Southern Command, US Central

Command, US European Command, and, soon, US Africa Command, whereas the

functional commands are US Transportation Command, US Joint Forces Command, US

Special Operations Command, and US Strategic Command.[122]

The preceding C2 concepts from *UNAAF* are reinforced and expanded upon in

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[121] *Ibid*., V-3, V-4.

[122] United States Department of Defense, "Unified Command Plan,"
http://www.defenselink.mil/specials/unifiedcommand/; Internet; accessed 3 April 2007.

subordinate doctrine. The keystone publication for operations, *JP 3-0 Joint Operations*,

lists C2 as the first of six common functions that aid a commander in integrating,

synchronizing, and directing joint operations at all levels of war.[123] *Joint Operations*

contributes to a commander's understanding of the concepts of Unity of Command and

Unity of Effort by reinforcing these concepts throughout. Additional detailed guidance

on C2 as it specifically applies to air, land, and naval forces is also available within the JP

3 series of publications.

Overall, US C2 doctrine is coherently laid out in a hierarchical structure that

allows key messages to be reinforced at each level of operations. Specific concepts are

well defined in capstone documents and provide a solid foundation for commanders to

design the organizations required to conduct successfully the operations they have been

given. While not explicitly based on a specific C2 theory, US C2 doctrine espouses most

of the concepts developed by McCann and Pigeau in their C2 framework. The ease of

accessibility of the documents ensures that commanders at all levels and all locations can

easily incorporate the concepts into their operations.

British Command and Control Doctrine

Much like in the US, there is extensive British joint doctrine at the operational

and strategic level. The capstone UK doctrine is *Joint Warfare Publication 0-01 British

Defence Doctrine*. This publication provides the overall strategic context for military

conflict and explains that the British approach to conducting military operations focuses

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[123] United States, Department of Defense, *Joint Publication 3-0 Joint Operations* (Washington, DC: US Government Printing Office, 17 September 2006), III-1.

on the key themes of the Principles of War; the warfighting ethos; the manoeuvrist approach; the application of mission command; the joint, integrated, and multinational nature of operations; and the inherent flexibility and pragmatism of British doctrine.[124] The basis of C2 doctrine is provided in a section entitled 'Mission Command' and the last chapter, 'The Philosophy of Command.'[125]

British Defence Doctrine explains that Mission Command is the British philosophy of command. This approach provides four enduring tenets; timely decision-making, clear understanding of commander's intent, subordinate ability to accomplish the task, and commander's will to see the operation to completion.[126] This is accomplished through the philosophy of mission command in which subordinates are told what effect they are to achieve and why, are provided with the required resources, and are not directed how to accomplish the objective.[127] Effective operations require commanders to strike a balance between supervision of tasks and delegation of decision-making authority. Too much direction results in loss of subordinate initiative, while too much delegation allows a loss of the coordinated action required to succeed. The key to achieving this balance rests in developing and maintaining "mutual trust and confidence amongst all officers at all levels."[128]

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[124] United Kingdom, Ministry of Defence, *Joint Warfare Publication 0-01 British Defence Doctrine* (n.p., October 2001), 3-1.

[125] *Ibid*., 3-7, 7-1 – 7-4.

[126] *Ibid*., 3-7.

[127] *Ibid*.

[128] *Ibid*., 7-1.

The next publication in the UK hierarchy of doctrine is *Joint Doctrine Publication 01 Joint Operations*. It is designed to be used with both *Joint Warfare Publication 3-00 Joint Operations Execution* and *Joint Warfare Publication 5-00 Joint Operations Planning*. These three publications together are aimed at the operational level commander and provide the UK's approach to joint operations.[129]

Joint Operations contributes a great deal of information on the nature of command and its contribution to both joint and multinational operations. Of particular note is the information provided on the role of a national Task Force Commander (TFC) when not acting as an operational commander. Designated the National Contingent Commander (NCC) in British doctrine, his role is pivotal in building coalition cohesion. The doctrine goes further, outlining the relationship the NCC has with subordinate UK forces:

> The NCC will have a clear command relationship with his national commanders embedded in the components, albeit not in a traditional sense. His role is largely to guide and counsel these subordinate commanders in building a strong and effective relationship with their respective Component Commanders, so that they can then influence both the plan and the subsequent employment of UK forces.[130]

Thus, UK doctrine provides specific responsibilities for the NCC to ensure that the necessary dual chain of command in multinational operations does not interfere with accomplishment of the mission.

The doctrine also provides guidance on the factors involved with choosing, or understanding, command relationships. These factors are listed as the scale, nature,

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[129] United Kingdom, Ministry of Defence, *Joint Defence Publication 01 Joint Operations* (n.p., March 2004), iii.

[130] *Ibid*., 4-6.

range, and likely duration of the problem; where and how best to apply influence to both

allies and key national decision-makers; where and how best to exercise command over

own forces using the philosophy of Mission Command; and the capacity and redundancy

of the communication and information system.[131] Understanding these factors will allow

commanders to create a command organization that is most effective for the mission.

Joint Operations Execution provides a rich base of information for operational-

level commanders and chiefs of staff to use. The largest of its three chapters deals

exclusively with guidance on how to establish a joint force headquarters for the two broad

frameworks within which British forces can be expected to operate. These two models

are based on operations in which the UK is the lead nation or a contributing nation.

Generic guidance is also provided such as a useful comparison of the different command

authorities used by NATO, the UK, and the US.[132]

The sections detailing guidance on the formation of TF headquarters are

comprehensive and provide information on such topics as where to locate HQs, categories

of staff officers, key relationships among the HQs, organization and responsibilities of

HQ components, and roles of the commander. This last topic is covered in detail,

especially for the case in which the UK is a contributing nation to a multinational force.

As discussed above, British doctrine is very specific on the role of the NCC:

> While a NCC can still be regarded as a fighting commander, this is not in the
> same sense as the JTFC. Although he is a key decision-maker and plays a
> pivotal role alongside the JTFC in building the coalition, he does not share the

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[131] *Ibid.*, 4-11.

[132] United Kingdom, Ministry of Defence, *Joint Warfare Publication 3-00 Joint Operations Execution* (n.p., March 2004), 2-2.

same command responsibility or authority in the multinational force as the JTFC.[133]

Essentially, the NCC is given the three responsibilities of influencing the coalition on the effective use of British forces, supporting those British forces in the accomplishment of their mission, and informing British national authorities of operational developments.[134]

The last of the British joint doctrine publications with significant C2 direction is *Joint Operations Planning*. This publication deals almost exclusively with the operational planning process. However, it contributes a great deal of information on the organization of operations conducted by NATO, the European Union, and the US.[135] This information allows British planners to understand the frameworks used by other organizations by comparing them to the known concepts used by the UK.

Used as a set, the British joint doctrine documents provide extensive guidance to operational commanders. Much attention has been paid to establishing a solid foundation of doctrine upon which successful operations may be carried out. The C2 principles and arrangements outlined in the publications provide British commanders the required information to plan and conduct operations including guidance on the establishment of effective TF organizations.

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[133] *Ibid.*, 2-18.

[134] *Ibid.*, 2-20.

[135] United Kingdom, Ministry of Defence, *Joint Warfare Publication 5-00 Joint Operations Planning* (n.p., March 2004), Annex 1B – Annex 1D.

Conclusion

The representative Allied C2 doctrine covered in this chapter provides an excellent foundation for commanders and staffs to use while planning and conducting operations. The guidance and concepts presented are examined in enough detail to enable useable principles to be extracted. The doctrine is provided within a strategic framework that provides context and unifying themes that are referred to throughout. For example, US doctrine uses the theme of 'Unified Action' to provide cohesiveness and British doctrine uses six key themes ". . . that permeate down through the joint doctrine hierarchy from British Defence Doctrine to the tactical level. . . ."[136] The publications are laid out in a rational, well-explained hierarchy and are available on the internet. The doctrine is up to date, relevant to contemporary military operations and provides the respective military forces superb direction with which to accomplish their assigned missions.

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[136] UK, MoD, *British Defence Doctrine*, 3-1.

CHAPTER 4 - CANADIAN FORCES COMMAND AND CONTROL DOCTRINE

CF C2 doctrine is proscribed in a number of publications. Explicit references to the concepts of C2 are contained in *B-GJ-005-300/FP-000 Canadian Forces Operations*, *B-GJ-005-500/FP-000 CF Operational Planning Process*, and several environmental publications. However, as discussed earlier, some of the McCann and Pigeau C2 framework appears in CF leadership doctrine as well. CF land forces have well established C2 doctrine, but the air and naval environments are still lacking in this subject. The following sections will examine currently available CF doctrine from the strategic down to the environmental level.

CF Leadership Doctrine

In order to understand why CF C2 doctrine is located where it is, an examination of the relationship between command, leadership, and management is required. As discussed earlier, McCann and Pigeau regard leadership's role in C2 as "the act of resolving intra- and inter-personal conflicts for the purpose of achieving common intent."[137] This act, therefore, establishes the conditions for, and motivates people towards, the four mechanisms of sharing common intent. Since the establishment of common intent is a function of C2, which is a product of command, they clearly view leadership as a part of command. This view is commonly accepted by most. For example, Peter Bradley argues that "leadership and management are properly conceived as subsets of command. In this way, a commander exercises command by alternatively

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[137] Pigeau and McCann, "Redefining Command . . .", 181.

leading and managing."[138] CF land command doctrine takes the same approach:

"Command incorporates leadership and management, both of which contain elements of

decision-making and control. The mix of these skills is present in varying degrees,

dependant upon the level of command."[139] Therefore, leadership abilities take

precedence at lower levels of command whereas effective management skills are more

desirable at higher levels.

Current CF leadership doctrine, recently published in A-PA-005-000/AP-003 –

Leadership in the Canadian Forces: Doctrine and A-PA-005-000/AP-004 – Leadership in

the Canadian Forces: Conceptual Foundations, differs slightly from the view above in

several aspects. First, it asserts that the "management role as practiced in civilian

organizations is functionally equivalent to the command role in the military."[140] This

view is clarified, however, by emphasizing that military command is set apart from

management by the unique abilities of commanders to resort to large-scale lethal force, to

compel subordinates to go into harm's way, and to dispense significant punishment

within the military justice system.[141] Second, CF doctrine recognizes that leadership can

take place outside the formal boundaries of the chain of command. For example, while

command authority may only be directed down the chain of command, leadership can be

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[138] Peter Bradley, "Distinguishing the Concepts of Command, Leadership and Management," in *Generalship and the Art of the Admiral: Perspectives on Canadian Senior Military Leadership*, ed. Bernd Horn and Stephen J. Harris, 105-120 (St. Catharines, ON: Vanwell Publishing Limited, 2001), 105.

[139] Department of National Defence, B-GL-300-003/FP-000 *Command* (Ottawa: DND Canada, 1996), 6.

[140] Department of National Defence, A-PA-005-000/AP-004 *Leadership in the Canadian Forces: Conceptual Foundations* (Kingston: Canadian Defence Academy – Canadian Forces Leadership Institute, 2005), 9.

[141] *Ibid*.

exercised, by anyone, down, up, across, or even outside the chain of command.[142]

Finally, the idea that skill in management is more desirable than skill in leadership as

commanders rise in rank is replaced by the twin concepts of 'Leading People' and

'Leading the Institution,' both facets of organizational leadership.[143]

With the relationship between leadership and command clarified, CF leadership

doctrine provides a values-based definition of leadership. Not content with the common

definition of "directly or indirectly influencing others, by means of formal authority or

personal attributes, to act in accordance with one's intent or a shared purpose"[144] the

definition is modified to one of effective leadership: "Directing, motivating, and enabling

others to accomplish the mission professionally and ethically, while developing or

improving capabilities that contribute to mission success."[145] While the definition has

removed the reference to intent, or shared purpose, it does provide a basis on which to

evaluate leadership, good, or bad, effective, or ineffective.

CF leadership doctrine also resolves leadership influence into two roles, direct

and indirect. Direct influence is a result of the face-to-face contact conducted during

"verbal direction, goal setting, practice training, coaching, contingent reward and

discipline, performance monitoring and feedback. . . ."[146] The influence is meant to be

almost immediate and to affect a subordinate's "ability, motivation, behaviour,

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[142] *Ibid*.

[143] Department of National Defence, A-PA-005-000/AP-003 *Leadership in the Canadian Forces: Doctrine* (Kingston: Canadian Defence Academy – Canadian Forces Leadership Institute, 2005), 6.

[144] *Ibid*., 3.

[145] DND, *Conceptual Foundations*, 30.

[146] *Ibid*, 6.

performance, attitudes, or related psychological states. . . ."[147] However, this definition

also allows for "incremental and delayed effects."[148]

Indirect influence affects others by way of "purposeful alterations in the task,

group, system, institutional, or environmental conditions that affect behaviour and

performance."[149] This leadership function is accomplished by changing the "content and

delivery of training programs, technology, organizational structures and procedures,

administrative policies and services, and organizational culture," and is expected to take

effect in the long term.[150] The concept of direct versus indirect leadership is also

identified in *Duty with Honour*. Here, a direct connection between level of command and

type of influence is provided:

> Officers, NCOs and warrant officers practise both kinds of leadership, but the
> distribution of time and effort on them varies with rank and appointment. At the
> strategic level, more time is spent on indirect leadership, while at lower levels
> more time is spent on direct leadership.[151]

Since the bulk of direct influence is expected to be conducted in the

accomplishment of day-to-day tasks below the formation level, while indirect influence

implies a longer time period due to the institutional changes required, CF leadership

doctrine has broken leadership effort into two broad functions; leading people and leading

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[147] *Ibid.*

[148] *Ibid.*

[149] *Ibid.*

[150] *Ibid.*

[151] Department of National Defence, A-PA-005-000/AP-001 *Duty with Honour – The Profession of Arms in Canada* (Kingston: Canadian Defence Academy – Canadian Forces Leadership Institute, 2003), 19.

the institution.[152] The role of leading people predominantly requires a capability to conduct direct influence while leading the institution requires more skill in indirect influence. It is recognized, however, that leading the institution requires some ability for direct influence while leading people likewise will require the ability for indirect influence. As discussed earlier, this duality has much in common with the relationships between command, leadership, and management.

CF Command and Control Doctrine

The single-source document for CF-wide operational doctrine is *B-GJ-005-300/FP-000 Canadian Forces Operations*. Issued in 2000 and amended in 2004 in an attempt to incorporate US joint doctrine, the current edition dates from 2005 but requires significant revision due to the recent operational-level command changes resulting from CF Transformation. It is the operations keystone-level document and devotes a full chapter to C2. *B-GJ-005-500/FP-000 CF Operational Planning Process* is the keystone document for planning and also has some points covering C2. However, there is no further expansion of Canadian C2 in a joint context in subordinate publications.

Canadian Forces Operations is composed of four major sections; 'Doctrinal Concepts and Guidance,' 'Operations,' 'Enabling Functions,' and 'CF Support to Operations.' Although Chapter Two is dedicated to Command and Control of CF Operations, additional direction for the C2 of various subjects and functions is contained in other chapters. For example, the chapters on 'Task Force Organization,' 'Combined

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[152] DND, *Conceptual Foundations*, 7.

Operations,' 'NATO Operations,' and 'Meteorology and Oceanography Support,'

amongst others, all have sections on C2.

Although it does not provide a unifying theme throughout the document,

Canadian Forces Operations does make initial broad guidance that the "CF will operate

internationally as part of an alliance or coalition."[153] This idea underlies the principles

stated in the rest of the publication, but is not examined in enough depth to provide the

guidance necessary to work effectively with allies or coalition partners.

General CF concepts applicable to C2 are presented in Chapter One, 'Concepts

and Guidance.' This guidance lays the foundation for how the CF conducts operations

and consists of categories and generic principles of operations. CF operations are broken

down into two broad types; routine and contingency. An examination of each category

highlights the need for the recent reorganization of the CF.

According to CF doctrine, routine operations are those

> . . . for which a specific Capability Component (CC) [air force, army, navy] has
> been specifically tasked, organized and equipped. Routine operations use
> existing command and control relationships and there is no requirement to use
> joint terminology. Doctrine for routine operations is generally Environmental in
> nature.[154]

This description implies that CF units are organized in a manner able to be

utilized for operational taskings of a routine manner. However, the doctrine goes on to

state in the section on Domestic Operations that: "In routine operations, TFs are formed

and TFCs are normally appointed on the initiative of the operational commander."[155]

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[153] Department of National Defence, B-GJ-005-300/FP-000 *Canadian Forces Operations*
(Ottawa: DND Canada, 2005), 1-2.

[154] *Ibid.*, 1-6.

[155] *Ibid.*, 1-7.

This seems to contradict the statement that routine operations use existing C2 relationships. If ad hoc TFs are created, some type of C2 arrangement will have to be determined and appropriate command authorities will have to be established. The recent formation of Canada Command resolved this confusion.

Contingency operations, the other category, are conducted by TFs either internationally or domestically when an operation falls clearly outside of the routine category or beyond the capability of the established C2 structure.[156] Since the CF does not maintain pre-formed TFs for contingency operations, a quick reaction deployable headquarters, the Joint Headquarters (JHQ), part of the Joint Operations Group (JOG) at CFB Kingston, is available to be used to help establish an international contingency task force.[157]

Chapter One also details several generic principles applicable to C2. Later parts of *CF Operations* expand upon some of these principles. A number of these principles concern the command relationships that must be established during a deployment. For instance, the "TFC [task force commander] must be appointed as soon as the operation is initiated and must be . . . delegated a level of command authority over all Canadian forces in the theatre of operations. . . ."[158] While this may seem like a statement of the obvious, it implies that a single TFC will have a specified degree of command over all CF personnel in a given theatre. If Canadian force elements have been assigned to different commanders under a lead nation-type of arrangement, the TFC will only be acting as the

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[156] *Ibid.*, 1-6, 1-7.

[157] *Ibid.*, 1-7.

[158] *Ibid.*, 1-8.

Canadian National Commander and, his primary responsibilities will lie in providing administrative support to Canadian personnel (rather than employing the forces in support of a mission).[159]

Another principle espoused is to "establish a command structure that clearly defines overall command responsibility. . . . Once a command structure is defined, the appropriate level of command authority is delegated to subordinate commanders."[160] The underlying meaning in this statement is that command relationships must support accomplishment of the mission and not the other way around. Only by establishing the TF organization according to the objectives of the mission can the appropriate responsibilities for subordinate commanders be determined. Granting, and therefore restricting, subordinate commanders' authorities prior to establishing the TF organization may hamper achievement of mission objectives.

The next principle is to "ensure that communications and information systems are interoperable, survivable, and complemented by standardized formats."[161] It conveys the same ideas as explained earlier for US C2 doctrine (*Responsive, Interoperable Support Systems*). The final principle in Chapter One is "delegate necessary decision making authority to the point of action."[162] This is equivalent to the concept of decentralized execution and ensures that commanders at all levels have the flexibility provided by their detailed understanding of the local situation to determine the best

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[159] *Ibid.*, 1-7, 8-2.

[160] *Ibid.*, 1-8.

[161] *Ibid.*

[162] *Ibid.*

course of action in support of the TFC's objectives. Implicit in this principle is the idea

of mission command and the associated concept of ensuring a subordinate commander

knows what is to be done, but leaving the details of how it is accomplished up to him.

Chapter Two of *Canadian Forces Operations* contains explicit definitions of C2

terminology, principles of command, and additional direction on command structures.

Although the term Command and Control (C2) is not defined, the publication does

provide its purpose: "C2 doctrine provides the framework within which military resources

drawn from different organizations can operate together effectively to accomplish a

common mission."[163] This seems to imply that C2 doctrine is not required outside the

routine or contingency operations specified earlier, or put another way, single-service

environmental C2 doctrine is not required since military resources are already operating

together effectively in these situations.

Command and control authorities in the CF are, unfortunately, defined using the

confusing, circular definitions addressed by McCann and Pigeau.[164] Command is defined

as the "authority vested in an individual of the armed forces for the direction, co-

ordination, and control of military forces" whereas control is defined as that "authority

exercised by a commander over part of the activities of subordinate organizations, or

other organizations not normally under his command, which encompasses the

responsibility for implementing orders or directions."[165] Command authority is delegated

as full, operational (OPCOM), or tactical (TACOM). Control is delegated as operational

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[163] *Ibid.*, 2-1.

[164] Pigeau and McCann, "Putting 'Command' back . . .", 2.

[165] DND, *CF Operations*, 2-1, 2-2.

(OPCON), tactical (TACON), administrative, or technical. Their differences are highlighted below and summarized in Figure 4-1.

Full Command. This level of authority covers all aspects of military operations and administration. In the normal, day-to-day training and administration of forces in garrison (i.e., not deployed on a CF operation), it is the authority vested in each commander, from the Chief of Defence Staff (CDS) down to unit commanding officers, to issue orders to subordinates. This level of command is not employed when assigning forces for operations.[166]

Operational Command. OPCOM differs from full command in that it does not include responsibility for administration or logistics. A commander delegated OPCOM may assign missions or tasks to subordinate commanders, deploy units, reassign forces, or assign separate employment to components of assigned units.[167]

Tactical Command. Narrower in scope than OPCOM, TACOM is the authority to assign tasks to forces under command for the accomplishment of an assigned mission. It, too, does not include administrative or logistic responsibilities but, unlike OPCOM, does not include the authority to delegate OPCON. [168]

Operational Control. The major difference between OPCON and OPCOM is that the former does not include authority to reassign forces or to assign separate employment of components of assigned forces. OPCON differs from TACOM because

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[166] *Ibid*., 2-1.

[167] *Ibid*.

[168] *Ibid*., 2-2, 2-3.

Table 4-1: Degrees of Command Authority

ACTIVITY	Authority	OPCOM	OPCON	TACOM	TACON	NOTES
Assign missions or tasks (1)	ALL*	YES	YES (2)	YES (2)	YES (3)	1. A mission is a task that together with its purpose, clearly indicates the action to be taken and the reason for it.
Direct assigned forces	ALL	YES	YES	YES (3)	YES (3)	
Delegate authority in CF Ops	OPCOM	YES	YES	YES	YES	
	OPCON	NO	YES	NO	YES	2. Provided it is in accordance with the mission assigned to the commander.
	TACOM	NO	NO	YES	YES	
	TACON	NO	NO	NO	YES	
Delegate authority in combined ops. (5)	OPCON	NO	YES	NO	YES	3. Local direction only.
	TACOM	NO	NO	YES	YES	4. Only for the particular mission or task
	TACON	NO	NO	NO	YES	
Reassign forces	ALL	YES	NO	NO	NO	5. Canada will normally retain OPCOM.
Assign separate employment	ALL	YES	NO	NO	NO	* The term AALL☐ means the described activity applies equally to all degrees of authority.
Administrative responsibility	ALL	NO	NO	NO	NO	
Deploy units	ALL	YES	YES (4)	NO	NO	

Source: Canada, Department of National Defence, *Canadian Forces Operations*, 2-3.

the latter does not include the authority to deploy forces while the former does not include

the authority to delegate TACOM to subordinate units.[169]

Tactical Control. TACON is the detailed, local direction and control of

movements or manoeuvres necessary to accomplish assigned missions or tasks.[170]

Administrative Control. This authority deals with all matters not included in the

operational missions of designated forces such as personnel management, supply,

transportation, finance, and food services. Since none of the command or control

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[169] *Ibid*.

[170] *Ibid*., 2-2.

authorities contain the responsibility for administration or logistics, this degree of authority must be specifically outlined in the TF initiating directive.[171]

Technical Control. Environmental commanders will always retain responsibility for certain functions that would be too difficult to transfer to operational commanders. These responsibilities, termed residual responsibilities since they are not included in the transfer of authority to a TFC, concern specific professional or technical matters such as airworthiness or flight safety and remain in the hands of the force generators.[172]

Chapter Two of *CF Operations* lays out the CF principles of command. These are: unity of command; span of control; chain of command; delegation of authority; freedom of action; and continuity of command.

Unity of Command. As described in US doctrine, unity of command establishes the conditions for unity of effort, which is essential to achieve national objectives. A single commander ensures forces understand the chain of command and provides a single point of reference to establish commander's intent.[173]

Span of Control. According to this principle, there is a limit to how many subordinate forces, activities, and areas of operation that can be directed by one commander. Large, complex tasks should be divided up so that individual commanders can focus on a limited set of objectives, thus ensuring the proper attention to the task.[174]

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[171] *Ibid.*, 2-2, 2-3.

[172] *Ibid.*, 2-2, 2-8, 2A-1.

[173] *Ibid.*, 2-4.

[174] *Ibid.*

Chain of Command. Bypassing levels of the chain of command should be avoided except in extraordinary circumstances. Commanders at each level in the chain need to know the status of forces both above and below them in order to continue unified action towards common objectives.[175]

Delegation of Authority. Similar to span of control, this principle ensures that commanders are not overwhelmed in the number of tasks they must perform. Delegating authority for certain tasks and actions to staff or subordinate commanders relieves commanders to concentrate on issues that are most important. Commanders must supervise subordinates as they carry out these functions since ultimate responsibility for their completion will always rest with the commander.[176]

Freedom of Action. As discussed earlier, subordinate commanders will usually have the local situational awareness and skills to accomplish the mission in the most effective and efficient manner. Superior commanders must ensure that their intent for the operation includes end states and objectives, but not the specific methods to be used.[177]

Continuity of Command. Since planned moves or unexpected events such as enemy action, physical fatigue, or equipment failure may preclude commanders from remaining in the chain of command, plans and facilities must be established to ensure no interruption of operations will occur as command is re-established. This principle also

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[175] *Ibid*.

[176] *Ibid*.

[177] *Ibid*.

recognizes the need for clear communication of commander's intent so that subordinates can continue operations until command is re-established.[178]

The last concept examined in Chapter Two of *CF Operations* is that of the supported/supporting relationship. While CF doctrine does not provide much detail in the explanation of this idea, the basic premise is that the ". . . commander having primary responsibilities for all aspects of a task . . ." will be a supported commander. The supporting commander develops a supporting plan and provides the supported commander with forces or other support as required.[179] Unfortunately, no reference to command authority is provided in the explanation, so how this relationship interacts with the delegation of OPCOM, OPCON, etc. is not clear.

The next chapter of *CF Operations* that deals directly with C2 issues is Chapter Seven, 'Task Force Organization.' This chapter lays out the structure of a generic TF and the responsibilities of the TFC, his staff, and the Environmental Chiefs of Staff (ECS) and Group Principles (the primary force generators for the TF). Since Canadian TFs are non-permanent and created for a wide variety of missions, there is not much specific direction contained in the doctrine. However, the following points are worth noting as a result of their impact on C2.

Much of the chapter is involved in emphasizing that, once formed, the TF and TFC are part of a new operational chain of command. The TFC will report directly to the establishing commander, whether that is the CDS or another authority.[180] As noted

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[178] *Ibid.*, 2-4, 2-5.

[179] *Ibid.*, 2-7.

[180] *Ibid.*, 7-2.

earlier, this relationship has been amended with the creation of Canada Command by establishing a permanent operational level headquarters to which TFCs will now report. Once transfer of authority to the TFC has taken place, the ECS are relegated to a supporting role as force generators and advisors on specific environmental issues. For example, in the case of the Air Force, the Chief of the Air Staff retains residual responsibilities such as flight safety during the employment of aircraft.[181]

TF organization outlined in Chapter Seven of *CF Operations* provides two methods of allocating resources to a TF. The generic example pictured (see Figure 4-1) is the Component Method and has the TF divided into the familiar land, maritime, and air components. Each component is be headed by a Component Commander who reports directly to the TFC.[182] Although the diagram indicates that OPCOM would be the command authority used, many other relationships are available. However, this doctrine does not provide examples of situations that would suit different command or control authorities, like TACON of individual units and liaison of special operations forces. The second method of TF organization is the Direct Method in which the TFC is directly controlling all force elements of the TF. Again, no example of this arrangement is provided and there is little discussion on when this method would be suitable, other than operations "where the size, complexity, time span and mission of an operation is usually limited."[183] Resultantly, CF C2 doctrine falls short of its objective of providing

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[181] *Ibid.*, 7-3.

[182] *Ibid.*, 7-1, 7-3.

[183] *Ibid.*, 7-3.
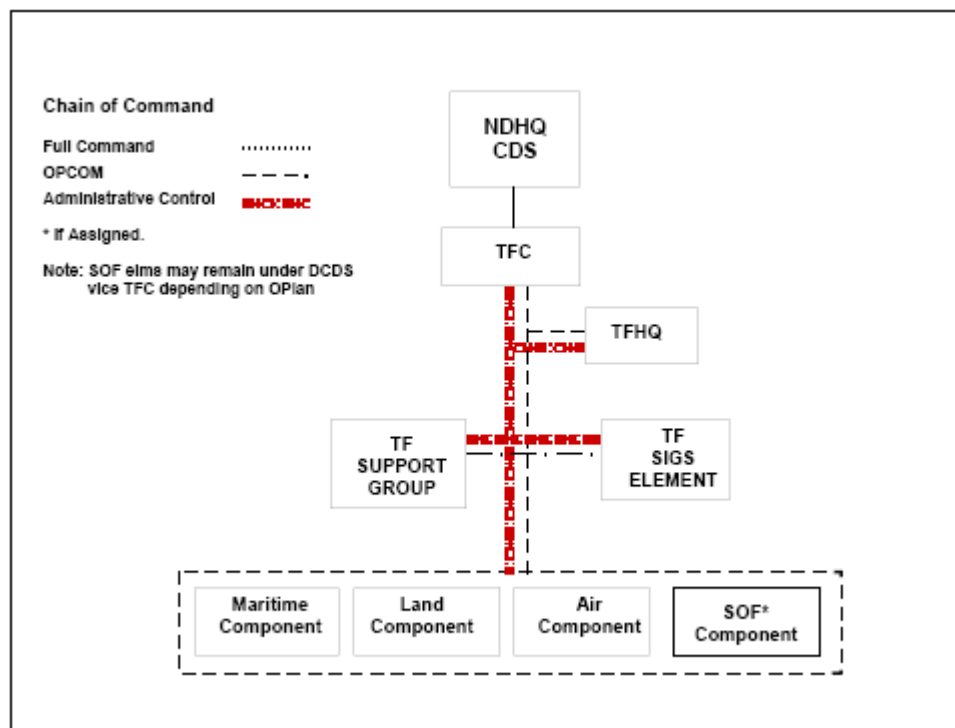
Figure 4-1: A Generic Canadian Forces Task Force
Source: DND, *CF Operations*, 7-1.

"commanders with underlying principles to guide their actions in planning and conducting operations."[184]

Another chapter that provides scant guidance on an important C2 concept is Chapter Eight, 'Combined Operations.' The term 'combined' denotes operations conducted by forces from more than one nation.[185] While there are several methods of organizing a combined TF, only one example is pictorially represented (see Figure 4-2).[186] This diagram depicts the familiar component method in which CF elements are subordinated to component commanders who, in this case, report to the combined Force

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[184] *Ibid.*, 1-2.

[185] *Ibid.*, 8-1.

[186] *Ibid.*
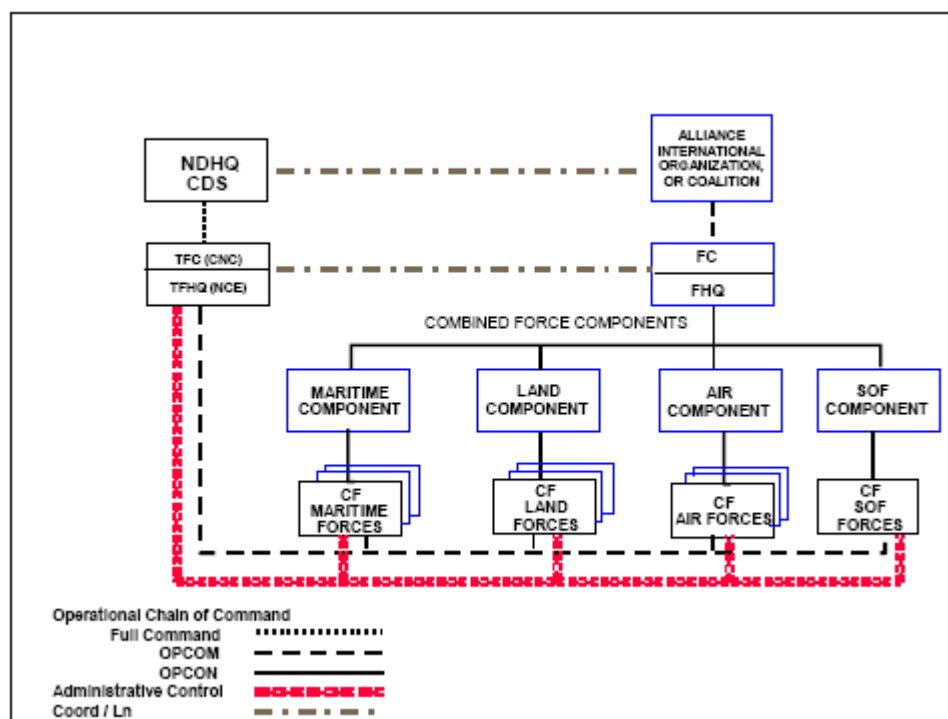
Figure 4-2: Combined Force Involving Canadian Forces
Source: DND, *CF Operations*, 8-1.

Commander (FC). The diagram indicates that the CF elements are part of two separate

chains of command, one, under OPCOM, reporting through the Canadian TFC to the

CDS, the other, under OPCON, reporting through the FC to the alliance or coalition

responsible for carrying out the mission. This departure from unity of command is

addressed by outlining two situations in which Canadian forces could find themselves

employed.[187]

  The first situation is characterized by the Canadian TFC functioning as an

operational commander, subordinate to the FC, exercising OPCOM (or another command

authority) over CF elements. The second, recognizing that the Canadian TFC is not

functioning as an operational commander, places CF elements under OPCON (or another

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[187] *Ibid.*, 8-2.

command authority) of the FC (or one of his component commanders). The Canadian

TFC then becomes a provider of administrative support to the Canadian elements rather

than a commander vested with OPCOM and the roles traditionally associated with that

level of command. The important distinction is in understanding which level of

command has the authority to conduct operations. The commander responsible for

operations must be delegated the applicable command authority. These two arrangements

are designated parallel (or, sometimes, multinational) and lead nation and are briefly

discussed in Chapter 11, 'Non-Combatant Evacuation Operations.'[188] Given current

operations, the lead nation situation is more likely and additional guidance on the unique

aspects of having Canadian Forces personnel under the command of foreign commanders

should be provided as part of doctrine.

As an aside, this issue is addressed somewhat in *B-GJ-005-307/FP-030 Peace*

Support Operations. Although produced for only one portion of the spectrum of military

operations, Peace Support Operations (PSO) doctrine does offer some detail on

multinational TF organization. Different field structures are illustrated and provided

context for how they fit within United Nations (UN) or coalition-led missions.[189]

Guidance on the role and organization of a Canadian contingent outlines the

responsibilities of the National Command Element (NCE), National Support Element

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[188] *Ibid.*, 11-5.

[189] Department of National Defence, B-GJ-005-307/FP-030 *Peace Support Operations* (Ottawa: DND Canada, 2002), 7-4 – 7-9.

(NSE), and Canadian National Commander (CNC).[190] In addition, some attempt is made

to contrast the standard Canadian C2 definitions (OPCOM, etc.) with those of the UN.[191]

Overall, in spite of its size, *Canadian Forces Operations* presents only the bare

minimum of the information required for conducting military operations in the complex

contemporary environment. Many of the fundamental principles for establishing

command structures are not covered in enough detail whereas quite detailed chapters are

provided for subjects such as intelligence and space operations. These topics could quite

easily become subjects of individual doctrine documents, thereby freeing up more room

for C2 guidance. There is also a lack of coherence to the document, as it seems to jump

haphazardly through various issues in successive chapters, without providing an

explanation of where or how CF operations fit into Canada's instruments of national

power. This lack of coherency could be a result of the lack of encompassing CF doctrine.

However, *CF Operational Planning Process*, provides some additional guidance

on C2 in its discussion on planning for operations. First, while acknowledging the

standard definition of command as authority vested in an individual, it recognizes that it

is exercised as a uniquely human capability and therefore, "CF doctrine espouses a

command-driven philosophy in all aspects of [force employment]."[192] Second, it

introduces the concept of operational command being one of six functions that are

integrated towards conducting a campaign at the operational level.[193] Part of this function

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[190] *Ibid.*, 7-11.

[191] *Ibid.*, 7A-1, 7A-2.

[192] Department of National Defence, B-GJ-005-500/FP-000 *CF Operational Planning Process* (Ottawa: DND Canada, 2002), 1-1.

[193] *Ibid.*, 2-9.

is establishing a command structure and the doctrine advises that centralized direction and decentralized execution may be achieved "through service component commanders, through functional component commanders . . . , through national component commanders or through some combination of these."[194] Unfortunately, no guidance is provided to assist commanders in determining which structure would be more appropriate or effective. Finally, the doctrine recognizes the importance of C2 during multinational operations by advising: "To avoid confusion and to ensure unity of command, commanders and staffs must consider C2 relationships and method of command in some detail, especially when dealing with allied or coalition forces."[195] In addition, "C2 arrangements are a critical aspect of any [course of action]. . . . In an alliance/coalition context the analysis of these relationships takes on added importance."[196] Once again, the doctrine does not provide enough guidance to be helpful to commanders. In order to examine C2 doctrine within the Canadian context fully it is necessary to review that of the environments. Land and Aerospace doctrine were chosen to review due to their availability and explicit treatment of C2 issues.

CF Land Command and Control Doctrine

Canada's Army has produced extensive doctrine for almost all its missions covering the strategic, operational, and tactical levels of war. The doctrine is laid out well in a rational hierarchy and is easily accessible on both the internet and CF intranet. The

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[194] *Ibid*.

[195] *Ibid*., 3-2.

[196] *Ibid*., 4-9.

two documents that have application to this discussion are *B-GL-300-001/FP-000*

Conduct of Land Operations – Operational Level Doctrine for the Canadian Army (CF

land doctrine), and *B-GL-300-003/FP-000 Command* (CF land command doctrine).

Expanding on the concept introduced in *CF Operational Planning Process*,

command is introduced early in CF land doctrine as the central of six combat functions.

Although the definition is no different from that stated in *Canadian Forces Operations*,

the concept is expanded to include the "importance of formulating and communicating

the commander's intent. A thorough understanding of the intent guides decisionmaking

at all levels, encourages both initiative and speed of action."[197] This importance is

highlighted in a discussion of commander's intent:

> Communicating the intent clearly and powerfully through numerous layers of
> command, each of which exerts a certain friction on effective communication is
> as vital as the formulation of the intent itself. However brilliant a commander's
> powers of leadership and decision making, they are of no use if he cannot
> communicate his intent clearly so that others can act. The intent may be
> transmitted personally, by addressing large audiences, visiting subordinates and
> units, issuing orders and directives or a combination of these methods.[198]

The utility of successfully communicating commander's intent is made apparent

with the discussion of another C2 principle, freedom of action. CF land doctrine contends

that freedom of action is required to enable on-scene commanders to take advantage of

rapidly changing situations. It is up to the commander to "decide how much freedom of

action that subordinates can be allowed at various stages of the operation. In doing so,

the commander must find the correct balance between centralization and

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[197] Department of National Defence, B-GL-300-001/FP-000 *Conduct of Land Operations – Operational Level Doctrine for the Canadian Army* (Ottawa: DND Canada, 1998), 24.

[198] *Ibid*., 44.

decentralization."[199] Even though communications and signals may be degraded due to adversary actions, a commander can rest assured that his direction is being followed because "[c]lear and simple orders, with a clearly understood commander's intent, enable subordinates to exercise disciplined initiative and flexibility while pursuing the commander's goals and priorities."[200]

Another concept that receives particular attention in CF land doctrine is that of command in combined operations. Army doctrine recognizes the unique aspect of dual chains of command and explains the requirement for effective liaison between the Canadian National Commander and the multinational FC.[201] The transfer of authority process is highlighted as two distinct steps in which the Canadian National Commander is first assigned OPCOM of CF elements from Canadian force generators and then transfers OPCON (or in certain cases OPCOM) to the multinational FC.[202] The Canadian commander's role is then described as providing "administrative support to the Canadian contingent of the combined force; to liaise with the combined force headquarters concerning the employment of Canadian Forces; and to monitor the employment of Canadian Forces."[203] These issues are explained well and provide proper context potential users of this doctrine.

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[199] *Ibid.*, 62.

[200] *Ibid.*

[201] *Ibid.*, 108.

[202] *Ibid.*, 110.

[203] *Ibid.*, 109.

Concepts of command, control, and C2 are further refined in CF land command doctrine. This publication provides a logical flow of guidance on command doctrine, including chapters on the nature of command, doctrinal, theoretical, and practical frameworks, as well as concrete procedures to be used both in the field and at operational-level headquarters. The highlights of Chapters One through Four are worthwhile reviewing to gain an understanding of this Land Force doctrine.

Chapter One, 'The Nature of Command,' introduces the context of military operations in a contemporary environment. It introduces the philosophy of Mission Command and captures the recognition of the need for clear articulation of commander's intent and necessity of a well-chosen C2 structure:

> Because war is a clash between human wills, each with freedom of action, commanders cannot be expected to anticipate, with absolute certainty, the enemy's intentions. The interactive and complex nature of war guarantees uncertainty, which to the military mind can suggest a loss of control. There are two ways to react. One is to attempt to seize control through strong centralized command. The other is to accept uncertainty as inevitable and adopt a decentralized philosophy of command that places emphasis on a common intent between all levels of command and trust of subordinate commanders.[204]

Within its discussion of control, Chapter One of land command doctrine identifies the need to incorporate feedback from subordinates in order to "attempt to reduce uncertainty and increase response speed by constraining the problem and imposing relative order."[205] This is in addition to the common view of control as a process or means of exercising command. Lastly, the chapter recognizes that while the philosophies of command and control are closely linked, the concepts are not equal and command

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[204] DND, *Command*, 3.

[205] *Ibid.*, 7.

takes precedence. For this reason, CF land command doctrine uses the term "command"
to incorporate the combined concepts of "command and control" throughout the
publication.[206]

Chapter Two, 'The Human Component of Command,' discusses the qualities of
an effective commander and his general responsibilities. An important aspect of this
chapter deals with the role of a commander prior to conducting operations. Considerable
explanation of the concepts of shared explicit and implicit intent and their subsequent
effect is provided.[207] These concepts form the basis of what is necessary for a
commander to pass on to subordinates in the planning and execution of operations. This
philosophy is developed in Chapter Three, 'The Doctrinal Component of Command.'

The Canadian Army has adopted Manoeuvre Warfare, supported by the
philosophy of Mission Command, as its approach to warfighting.[208] Chapter Three
provides the doctrinal background of these two concepts. In effect, Mission Command
provides commanders at all levels the intimate knowledge of the mission and required
flexibility in its execution necessary for the success of Manoeuvre Warfare. This chapter
solidifies the concepts of explicit and implicit intent from the previous section into that of
'Commander's Intent.' This and several other terms such as the 'Concept of Operations,'
and 'Mission Statement,' are defined to ensure that the decentralized execution of
Mission Command does not interfere with the unity of effort required for successful

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[206] *Ibid*.

[207] *Ibid*., 21.

[208] *Ibid*., 28.

Manoeuvre Warfare.[209] The doctrine even goes as far as to suggest that the concept of common intent is important enough that Commander's Intent must be understood two levels of command below the issuing commander.[210] Unity of effort, decentralized authority, trust, mutual understanding, and timely, effective decision-making are provided as the fundamentals of Mission Command.[211] The importance of a common language underscores the description of one of these fundamentals, mutual understanding.[212]

Chapter Four presents the final component of command to be examined, 'The Theory of Command Organization.' The important concepts presented in this chapter relevant to the discussion of C2 include organizing fundamentals, chain of command, command relationships (authorities), span of command, and the structure of a command.

The theoretical discussion presents five organizational fundamentals. The first fundamental, unity of command, proscribes that each element in the chain of command should be accountable to only one superior commander. Unity is accomplished with a clearly established chain of command and the doctrine recognizes that it may not be achievable in combined operations as discussed earlier.[213] The second, cooperation, emphasizes the familiar principle of war in its efforts to support command. Cooperation is enabled by teamwork, trust, and mutual understanding and is formalized by using

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[209] *Ibid*., 33.

[210] *Ibid*., 32-33.

[211] *Ibid*., 30.

[212] *Ibid*., 35.

[213] *Ibid*., 43.

common doctrine and clearly defined command relationships.[214] The third fundamental,

a balanced structure, is affected by adjusting the span of command, or the number of

direct subordinates to a commander.[215] The fourth, responsive procedures, expresses the

need for simple, efficient, and flexible procedures that enable the maintenance of tempo

within a command. Standard Operating Procedures (SOPs) are one method of achieving

this.[216] The final fundamental is that of a dynamic organization, in that commands must

be flexible in how they are structured to reflect the changing situation and threat.[217]

Chapter Four expands the discussion of many concepts only briefly introduced in

other versions of C2 doctrine. The requirements for an effective chain of command are

described along with illustrative examples of how the chain of command affects decision-

making, information flow, and loss of communication.[218] Although the standard

Canadian definitions of command relationships are used, Land Command doctrine also

offers guidance on how to choose the correct relationship for the situation.[219] It also

provides additional clarification on the differences between command relationships and

control relationships. The command authorities of OPCOM and TACOM are commonly

used for the manoeuvre arms (infantry, armour, aviation, and close support engineers)

whereas the control authorities of OPCON and TACON are normally reserved for the

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[214] *Ibid.*

[215] *Ibid.*, 44.

[216] *Ibid.*

[217] *Ibid.*

[218] *Ibid.*, 44-45.

[219] *Ibid.*, 45-46.

support arms (artillery, general support engineers, signals, intelligence, and military police) and service support arms (medical, dental, administrative, transport, supply, maintenance, and personnel support).[220] As discussed earlier, the concept of span of command is important to consider in the organization of a command. Land command doctrine advocates that perhaps no more than four or five active points of command (subordinate commanders) can be controlled effectively. It provides guidance on the factors that affect the optimal span, and illustrates the risks and benefits of narrowing or broadening the span of command.[221] Finally, Chapter Four provides a discussion on organizational structure, emphasizing the penalties and benefits to cohesion and tempo provided by the frequent re-grouping of forces sometimes necessary in ad-hoc organizations.[222]

The first four chapters of *Command* provide a solid framework of C2 based on theory and doctrine. The final three chapters build upon this foundation to discuss how to establish a command, including an effective headquarters, and a detailed explanation of the command decision cycle, encapsulated in the steps of Battle Procedure. The overall effect is a coherent work of doctrine that provides land commanders with most, if not all, of the concepts required for effective command in the accomplishment of mission objectives using the warfighting approach of Manoeuvre Warfare.

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[220] *Ibid*., 59.

[221] *Ibid*., 46-47.

[222] *Ibid*., 48.

CF Aerospace Command and Control Doctrine

Contrasted with CF land doctrine, CF aerospace doctrine is much more recent

and nowhere near as extensive. The keystone doctrine manual, *B-GA-400-000/FP-000*

Canadian Forces Aerospace Doctrine, has only just recently become available. The

document has borrowed heavily from US Air Force basic doctrine for both form and

content. The Canadian Forces Aerospace Warfare Centre (CFAWC) has also started

production of subordinate CF aerospace doctrine, including aerospace C2 doctrine.

However, these documents are in draft form as of this writing.

CF Aerospace Doctrine does well to lay the initial foundation for future

aerospace C2 doctrine. This foundation is built by establishing the 'Tenets of Aerospace

Power' that derive from the unique capabilities and characteristics of aerospace forces.[223]

The 'Tenets of Aerospace Power' are to be used in the application of air power in the

same way that the time-tested Principles of War should be considered in the general

employment of military power.[224] In this way, they provide the guidance for effective use

of aerospace forces. The tenets, and their applicability to C2, are worth examining

further.

Centralized Control and Decentralized Execution. The requirement of

centralized control of aerospace forces derives from their complexity and limited

availability. The responsibilities for the use of aerospace power must be vested in a

single commander to ensure the scarce resources are used efficiently and effectively in

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[223] The tenets are copied directly from US Air Force Doctrine Document 1, their capstone aerospace doctrine.

[224] Department of National Defence, B-GA-400-000/FP-000 *Canadian Forces Aerospace Doctrine* (Ottawa: DND Canada, 2006), 30.

support of the objectives of the FC's. Decentralized execution ensures that authority is delegated to the appropriate commander based on his knowledge of the mission and situation.[225]

Flexibility and Versatility. C2 organizations must be structured to enable aerospace forces to respond in a quick and decisive manner from one objective to another. Their versatility ensures that aerospace power can be used effectively across the spectrum of operations at all levels of conflict.[226]

Synergistic Effects. Command and control of aerospace forces must be able to take advantage of the benefits of working in joint or combined operations where overall effects are often more than the sum of individual contributions.[227]

Persistence. The aerospace characteristics of speed and reach allow commanders the ability to use aerospace forces to apply persistent effects without continued presence. C2 processes must be able to take advantage of this capability.[228]

Concentration. An important role of the centralized commander is to ensure that aerospace forces are used to support the unity of effort designated by a FC and that their effects are not diluted by competing requests from various other sources.[229]

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[225] *Ibid*.

[226] *Ibid*.

[227] *Ibid*.

[228] *Ibid*.

[229] *Ibid*., 31.

Priority. Once again, due to their limited availability, use of aerospace forces must be prioritized at the highest levels. C2 structures and processes must provide a commander the information he requires to ensure this tenet is followed.[230]

Balance. An effective C2 system will allow a commander effective allocation of resources towards mission objectives while balancing the requirements of the other principles of war, tenets of aerospace power, and mission risk.[231]

The doctrine then lists the five 'Functions of Aerospace Power,' nominating 'Command' as the central principle to which the other functions of 'Sense,' 'Shape,' 'Move,' and 'Sustain' are all linked. Although the standard definition of command from *Canadian Forces Operations* is used, aerospace doctrine does highlight several roles of C2 organizations such as "the analysis of information, the development of plans, the preparation of orders, the organization and deployment of forces in preparation for conflict, and once operations begin, the coordination and adjustment of the plan's execution."[232] These roles do not provide anything new for the practitioner of aerospace power looking for guidance.

The final chapter of *Canadian Forces Aerospace Doctrine* is devoted to command and control issues. It does attempt to advance C2 doctrine by adding the McCann and Pigeau definitions of command and control to those already dictated by *Canadian Forces Operations*.[233] Unfortunately, while incorporating the concepts of

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[230] *Ibid*.

[231] *Ibid*.

[232] *Ibid*., 47.

[233] *Ibid*., 49-50.

human creativity and will into the definition of command, and that of risk management into control, the doctrine fails to link the concepts together into a new framework for C2.

The last chapter also provides a list of the 'Principles of Command.' These principles ('Unity of Command,' 'Span of Control,' 'Chain of Command,' 'Delegation of Authority,' 'Freedom of Action,' and 'Continuity of Command') are unchanged from *CF Operations*.[234] However, they are not provided any aerospace context for their interpretation; the principles are explained using similar language used in the joint doctrine publication. The same can be said for the command and control relationships of OPCOM, TACON, etc., again, taken verbatim from *CF Operations*, without the additional benefit of applying them to aerospace operations.[235]

CF Aerospace Doctrine does provide some C2 guidance unique to aerospace forces. Embracing the tenet of Centralized Control and Decentralized Execution, the doctrine states that since aerospace power is "inherently complex and costly . . . it is essential that it be centrally controlled by a single air commander to ensure the optimal and effective use of its unique characteristics."[236] This single commander is identified as the Air Component Commander (ACC) "who becomes responsible for the planning, coordination, allocation, and tasking of all joint/combined air operations."[237] The ACC produces tools such as the Air Tasking Order (ATO) and the Air Operations Directive (AOD) for

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[234] *Ibid.*, 50.

[235] *Ibid.*, 51-52.

[236] *Ibid.*, 53.

[237] *Ibid.*

subordinate commanders that enable the centralized control and decentralized execution of aerospace operations.[238]

Unfortunately, the doctrine also provides guidance that contradicts other established guidance. While discussing the concept of the ACC, it gives the impression that there is a direct connection between domestic operations being joint, and deployed operations being combined.[239] Likewise, only the lead-nation type of structure for conducting deployed operations is described. The parallel (or multinational) organization and the possibilities of conducting single-service domestic or single-nation deployed operations are not addressed by this emergent doctrine.

Overall, *Canadian Forces Aerospace Doctrine* does succeed in laying the foundation for C2 of aerospace forces. The 'Tenets of Airpower' are used for this foundation, but are not utilized to the extent required to produce the necessary guidance for the unique aspects of aerospace forces. Currently, the CFAWC is in the process of producing doctrine subordinate to *CF Aerospace Doctrine* on topics of expeditionary force support, force protection, and C2. At the time of this writing however, the draft CF aerospace C2 doctrine is little more than a detailed summary of the McCann and Pigeau C2 framework combined with an extensive history of Canadian aerospace force organization.[240] CF aerospace doctrine needs to be updated to establish additional principles for commanders to use in the employment of aerospace forces towards mission objectives.

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[238] *Ibid.*, 54.

[239] *Ibid.*, 53.

[240] Draft copies of this doctrine were provided for review by the author and others on Joint Command and Staff Programme 33, at Canadian Forces College during Spring 2007.

Conclusion

The quality and quantity of various CF joint and environmental doctrine varies from subject to subject. There has been a great deal of leadership doctrine produced in the past five years. This doctrine is well presented, founded on a good theoretical base, with a unifying theme throughout. The Canadian Army has always had extensive doctrine. The volumes examined in this chapter provide useful additional guidance for principles established in superior CF doctrine. Canadian aerospace doctrine, only just promulgated, borrows extensively from US doctrine. That said it has built a solid foundation for subordinate titles that are currently going through various stages of review. CF joint operational doctrine needs to be rewritten with a single unifying strategic underlying theme or principle. It attempts to provide guidance for a wide variety of subjects but fails to examine critical topics such as multinational operations in sufficient detail. In the absence of subordinate doctrine for these subjects, commanders are left without effective guidance.

CHAPTER 5 - ANALYSIS OF CF COMMAND AND CONTROL DOCTRINE

Militaries must keep two broad, sometimes competing, concepts in mind when producing doctrine. First, doctrine should reflect the national laws and governmental policies of the nation. Second, doctrine must allow the military forces of that nation to perform effectively with other national forces in combined or multinational operations. This is recognized in guidance for development of CF doctrine:

> It is Canadian Forces policy that our doctrine, both joint and single-service, should be consistent to the maximum extent possible with the doctrine of our principal allies. In this regard, the United States is Canada's "most important ally." Doctrinal interoperability with the United States is therefore to be a primary goal of Canadian Forces doctrine development. . . . It is also highly desirable that Canadian Forces doctrine development be done in cognisance of the doctrine of the United Kingdom . . . due to similarities in force structures, basic laws and tradition. . . . Interoperability with allies does not provide justification for the development of Canadian Forces doctrine that is inconsistent with Canadian Law, Government of Canada policy or Department of National Defence policy.[241]

Doctrine must also be kept up to date. Several factors can require doctrine to be updated and ". . . [w]hen any of these factors changes significantly, applicable doctrine should be reviewed to determine whether a change is necessary. . . ."[242] Emerging concepts are one class of inputs that may require a review. The C2 framework established by McCann and Pigeau is certainly one example of an emerging concept that could have a positive effect on Canadian doctrine. However, as highlighted above, these changes need to be consistent with national direction and interoperable with close Allies. The McCann and Pigeau framework satisfies both of these requirements. This chapter

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[241] DND, *CF Doctrine Development*, 1-7.

[242] *Ibid.*, 2-8.

analyzes Canadian C2 doctrine by contrasting it with the Allied doctrine presented in Chapter Three and examining it against the principles of the McCann and Pigeau framework covered in Chapter Two.

Comparison of Allied and CF Command and Control Doctrine

Comparing Canadian military doctrine to that of countries such as the US or the UK may seem like comparing apples and oranges. However, due to the "similarities in force structures, basic laws and tradition" noted above, there is much more in common than not. There are obvious contrasts such as the different directions each nation takes when stating their strategic context for military operations. More subtle differences lie in the expression of various principles or tenets contained in the guidance. An examination of each of these categories provides food for thought.

A review of US doctrine gives one an indication that American military forces have been established and organized to support the global influence the US enjoys today. Throughout US doctrine, there are continuing references to the fact that the US military is constantly employed throughout the world in pursuit of national objectives. American C2 structures (the permanent unified combatant commands) are established to enable US forces to respond with strategic agility. British doctrine also establishes core values and basic principles while putting them in the context of their primary mission. Canadian C2 doctrine, on the other hand, is divided into two areas. The first group is made up of publications concerning CF leadership doctrine, like *Duty with Honour*. Although not promulgated as operational doctrine, these documents provide the same type of strategic context that US and UK capstone publications do. The Canadian military ethos, values, and command principles that are established in these publications provide a positive

example for other Canadian doctrine. However, Canadian joint operational doctrine lies in a different realm. This doctrine does not provide any linkage back to a military strategic context; it does not build upon the foundation laid by the leadership doctrine and the guidance seems haphazard and without context. Despite this, Canadian environmental doctrine does a much better job of addressing these issues. Although not yet making direct linkages back to CF leadership doctrine, both land and aerospace doctrine have attempted to incorporate many of the common principles derived from Canadian experience which are now captured in CF leadership doctrine. The result is a much more cohesive body of guidance flowing from the strategic to the operational level.

One conspicuous difference between Canadian and Allied C2 doctrine is the extent of guidance for TF establishment and organization. Both US and UK doctrine provide detailed guidance on types of TFs and when specific command structures should be used. On the other hand, Canadian operational doctrine only roughly outlines what a contingency TF is and how it should be commanded. This may be done to maintain flexibility for the varied missions for which the CF could be tasked. Unfortunately, it also leaves Canadian TFCs little detailed assistance for establishing and organizing a TF. This may not be such a problem, as some have suggested that C2 of Canadian operations is becoming more centralized at the strategic level, calling the requirement of an operational-level commander into question.[243]

The difference in doctrinal approach is most evident for multinational operations. Canada will continue to conduct deployed operations as part of multinational

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[243] Daniel P. Gosselin, "The Loss of Mission Command for Canadian Expeditionary Operations: A Casualty of Modern Conflict?," in *The Operational Art: Canadian Perspectives – Leadership and Command*, ed. Allan English, 193-228 (Kingston: Canadian Defence Academy Press, 2006), 202.

TFs, most likely in coordination with, or subordinate to, US or UK forces. Additional guidance on these command structures, with associated dual chains of command, is necessary. To some extent this discrepancy is addressed in CF Peace Support Operations and Army doctrine. *Duty with Honour* realizes this will be a key task in adapting the CF to future challenges:

> Defining, acquiring and maintaining the appropriate body of professional expertise in the face of these [non-traditional threats] will be a demanding and ongoing task. Areas that will require attention include joint concepts and doctrine [and] . . . understanding multinational operations, including complex chains of command. . . ."[244]

Another difference between American and Canadian (in fact, between US and most NATO countries) doctrine lies in the definitions of the command relationships or authorities. While Canada follows the NATO guidelines of full command, OPCOM, TACOM, OPCON, and TACON, the US only uses COCOM, OPCON, TACON, and Support. Since the US is Canada's closest ally, Canadian doctrine should address this difference, by either redefining the Canadian relationships or providing a comparative guide to the differences in use of the terms. British doctrine does this effectively by comparing them side-by-side in a table.

Many of the C2 principles from Allied doctrine highlighted in Chapter Three are contained in Canadian publications. One notable exception in Canadian doctrine is the lack of guidance concerning the philosophy of Mission Command at the joint operational level. This concept is communicated within the principle of Commander's Intent within US doctrine and it is provided for explicitly within the British philosophy of command. While a portion of the concept is conveyed within the Canadian principle 'Freedom of

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[244] DND, *Duty with Honour . . .*, 71.

Action,' the overall philosophy is not discussed at all at the joint level. Since CF aerospace doctrine uses the principles from CF joint doctrine, it, too, fails to capture this concept. Only CF army doctrine explicitly incorporates Mission Command and uses it well to provide a unifying theme throughout.

Overall, Canadian doctrine is most disappointing at the joint operational level. The lack of context for military operations within the Canadian strategic framework leads concepts and principles to be promulgated without any connection to a unifying theme. These themes are available in CF leadership and environmental doctrine therefore additional work is necessary to provide consistency throughout all CF doctrine.

Examination of CF Doctrine Using the McCann and Pigeau Framework

The McCann and Pigeau C2 framework has been available for the better part of a decade and its concepts are slowly being incorporated into Canadian doctrine. While much CF leadership and some CF environmental doctrine have incorporated their ideas, there is a noticeable absence of this framework within CF operational doctrine. The following section will highlight areas where these concepts have been included and areas that could benefit with more development.

The relatively new *Duty with Honour* and CF leadership doctrine have included several of the ideas from the McCann and Pigeau framework. As expected from the doctrinal subject matter, most of these ideas have been adapted into the CF Leadership Model that is provided. The concept most apparent in the doctrine is that of sharing

intent. While CF leadership doctrine does not discuss the explicit and implicit portions of

intent, it does make sharing intent a significant contributor to mission success.[245]

An important portion of McCann and Pigeau's implicit intent are the military

expectations that are based on training, doctrine, tradition, and ethos.[246] Their framework

also suggests that this implicit intent needs to be shared by military members in order to

reduce the amount of explicit intent required to achieve mission success.[247] CF leadership

doctrine recognizes the importance of this concept stating that ". . . culturally appropriate

and deeply ingrained norms of conduct can substitute for, and reduce the requirement for,

a lot of hands-on directive leadership and external control and discipline."[248] The manner

of sharing these military expectations is described in *Duty with Honour* as acquiring a

common body of knowledge:

> Although military professionals are differentiated in part by the kinds of
> expertise they possess, the profession must act as a coherent whole. There is,
> therefore, a common body of knowledge that achieves this coherence, plays an
> integrating role through the development of a basic understanding of the
> generation and use of armed force, and allows each member to relate his or her
> function to the overall objective of the ordered application of military force.
>
> Imparting such basic knowledge is an important part of the early socialization
> process and becomes increasingly more substantive as the member progresses.
> The common body of knowledge is upgraded throughout a member's career.
>
> Beyond such subjects as Canadian military history, this knowledge includes
> fundamental leadership theory; management theory and practice, especially

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[245] DND, *Conceptual Foundations*, 48.

[246] Pigeau and McCann, "Redefining Command and . . .", 166.

[247] *Ibid*., 169.

[248] DND, *Conceptual Foundations*, 82.

resource management; the importance and role of military forces; the theory and practice of military professionalism; communications; and ethics.[249]

CF leadership doctrine does not completely abandon the concepts of explicit and implicit intent, however. They are presented as the principles of direct and indirect influence. The concept of sharing explicit intent is contained within the meaning of direct influence. According to the leadership doctrine, direct influence "means face-to-face influence on others which has an immediate effect on their ability, motivation, behaviour, performance, attitudes, or related psychological states. . . ."[250] This has an obvious correspondence to McCann and Pigeau's idea of explicit intent, being the publicly communicated information required in transmitting an aim or purpose. The CF idea of direct influence, however, also contains some of the concept of implicit intent. Indeed the definition goes on to state that direct influence means face-to-face influence on others "which progressively modifies the slow-growth attributes of individuals and groups."[251] This portion of direct influence has more in common with the concept of implicit intent and its associated long-term sharing through socialization.

Indirect influence, on the other hand, acts by "purposeful alterations in the task, group, system, institutional, or environmental conditions that affect behaviour and performance."[252] Examples include "changes in content and delivery of training programs, technology, organizational structures and procedures, administrative policies

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[249] DND, *Duty with Honour*, 52.

[250] DND, *Conceptual Foundations*, 6.

[251] *Ibid*.

[252] *Ibid*.

and services, and organizational culture."[253] This concept has much in common with the idea of sharing the military expectations of implicit intent that are based on doctrine, training, tradition, and ethos. This influence "involves organizational and strategic leadership and is focused on long-term results in objectives or organizational culture."[254] Therefore, much of McCann and Pigeau's concept of establishing common intent is contained within the ideas of direct and indirect influence in CF leadership theory.

Another portion of CF leadership doctrine that can be contrasted with the McCann and Pigeau framework concerns the difference between transactional and transformational leadership. McCann and Pigeau proposed that styles of leadership can be differentiated by the psychosocial distance between leader and follower combined with their method of sharing intent. At one end of the scale is the autocratic leader who stands aloof from her followers and imposes her explicit intent. At the other end of the scale is the transformational leader who indoctrinates followers into her intent hierarchy to become the model of behaviour. In between the two extremes lies transactional leadership that is characterized by increased sharing of intent hierarchies through social interaction and exchange.[255] This social exchange facilitates fulfilment of both leader's and follower's needs that are often not completely conscious. Since much of the intent hierarchy is also unconscious, transactional leadership is well suited to establish common intent.[256]

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[253] *Ibid*.

[254] DND, *Duty with Honour*, 19.

[255] Pigeau and McCann, "Redefining Command and . . .", 177-179.

[256] *Ibid*., 180.

CF leadership doctrine takes a slightly different approach. The doctrine states that leadership styles can be differentiated by the degree of control they maintain over subordinates. One end of the scale is occupied by an authoritarian style while the other is characterized by the *laissez-faire* method.[257] Somewhere in between is transformational leadership that seeks to "alter the characteristics of individuals, organizations, or societies in a fairly dramatic or substantial way so that they are somehow more complete, or . . . better equipped to deal with the challenges they face. . . ."[258] In contrast, transactional leadership is defined as an exchange of behaviour for basic material needs. While the two styles succeed due to people's varied needs, transformational leadership extends transactional leadership by addressing higher-order individual needs.[259]

It is apparent that McCann and Pigeau advocate transactional leadership while CF leadership doctrine advocates transformational leadership. This does not mean the two sources are in contradiction. In fact, both works state that either of the two styles can be applicable in certain circumstances. However, it is interesting to note the slightly different emphasis that each source places on the type of leadership. This slight differing of opinion seems to be rooted in the choice of scale upon which each analysis differentiates leadership styles.

CF land doctrine has also made a significant effort to incorporate the McCann and Pigeau framework into its guidance and principles, using McCann and Pigeau's twin concepts of explicit and implicit intent. Also provided are examples of how shared intent

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[257] DND, *Conceptual Foundations*, 64.

[258] *Ibid.*, 67.

[259] *Ibid.*, 69.

compares between preformed units with long periods of affiliation and ad hoc units formed for contingency operations.[260] Army doctrine writers did well to use these ideas, as they were brand new when the doctrine was produced in 1996.

The emphasis that McCann and Pigeau attach to establishing common intent is captured in CF land command doctrine as one of the three tenets of mission command, which supports the manoeuvre warfare approach to warfighting.[261] A great deal of detail is provided on how to ensure that commander's intent is understood. Of the five fundamentals of mission command, only timely decision-making does not incorporate concepts from the McCann and Pigeau framework. Unity of effort and decentralized authority are only possible if complete understanding of commander's intent is achieved. Trust is based on "shared implicit intent, which enhances mutual understanding."[262] While mutual understanding, as indicated earlier, requires a common "language of command."[263] This common language is precisely one of the factors required to share explicit intent.[264]

CF aerospace doctrine also attempts to incorporate the McCann and Pigeau framework. While the chapter on C2 uses the framework's definitions of both command and control to expand the traditional definitions of those terms, the concept of

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[260] DND, *Command*, 21.

[261] *Ibid*., 30.

[262] *Ibid*., 35.

[263] *Ibid*.

[264] Pigeau and McCann, "Redefining Command and . . .", 168.

establishing common intent is not introduced.[265] The doctrine therefore fails to take advantage of the rich ideas that the McCann and Pigeau definition of C2 provides. Just as unfortunate, the notion of establishing common intent is not used to explain the principles of command (unity of command, span of control, chain of command, delegation of authority, freedom of action, and continuity of command).[266] Many of the principles could be re-written using concepts from the McCann and Pigeau framework to provide additional guidance. For example, freedom of action becomes available in a decentralized C2 structure in which delegation of authority has been made. This decentralized structure is only made possible by a high degree of shared implicit intent.[267]

Contrasted with CF leadership and environmental doctrine, CF joint operational doctrine has not attempted to incorporate the McCann and Pigeau framework. All of the C2 definitions use the standard NATO terminology without any attempt at bringing in concepts such as common intent. There are places in which the framework would add clarity to principles and concepts. For example, in addition to the principles of command discussed above, the concept of common intent could be used to provide additional guidance for topics such as multinational operations. There are many implications based on this concept for commanders to use when dealing with ad hoc multinational groupings and units. These implications can be used to provide guidance on types of command structures and requirements for liaison and coordination centres in order to overcome the limited amount of time available to establish shared implicit intent.

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[265] DND, *CF Aerospace Doctrine*, 49.

[266] *Ibid.*, 50.

[267] Pigeau and McCann, "Redefining Command and . . .", 175.

Conclusion

Much Canadian doctrine compares favourably with Allied doctrine, especially at the environmental level. However, there are several areas where the doctrine could be made more compatible in order to enhance interoperability. Further examination of the US command relationships and additional guidance on multinational C2 considerations are two such areas. Likewise, the McCann and Pigeau C2 framework has been adopted by CF leadership and environmental doctrine with varying degrees of success but there is still much room for improvement within joint operational doctrine to incorporate these ideas. This would provide a much more consistent message. CF joint doctrine seems disjointed in its presentation compared with CF leadership/environmental and Allied doctrine. On the other hand, the McCann and Pigeau framework is easily used to evaluate the doctrine and may provide the underlying theme required to give CF doctrine a cohesive finish.

CHAPTER 6 - CANADA COMMAND

The stand-up of Canada Command (Canada COM), as one of the new operational CF commands, was the result of an enormous amount of work accomplished in a very short time. Operations were started a little over one year from the announcement that the command would be formed. Due to the significant effort that went into establishing the command structure, it is worth examining the C2 of the new command to see how it compares to doctrine and theory. After reviewing the current C2 of Canada COM, including an examination of the historical C2 of domestic operations, the structure will be compared to Canadian doctrinal C2 principles as well as the McCann and Pigeau C2 framework.

Historical Command and Control of Domestic Operations

Until 1 February 2006, domestic operations were operationally commanded by one of the existing formation-based headquarters: Maritime Forces Atlantic (MARLANT), Maritime Forces Pacific (MARPAC), Land Forces Atlantic Area (LFAA), Land Forces Quebec Area (LFQA), Land Forces Central Area (LFCA), Land Forces Western Area (LFWA), 1 Canadian Air Division (1 Cdn Air Div), or Canadian Forces Northern Area (CFNA).[268] These formations reported to one of the three Environmental Chiefs of Staff (ECS) who were, in turn, responsible for the dual roles of "exercising command of assigned forces conducting force generation and routine operations."[269]

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[268] DND, *CF Operations*, 1-7.

[269] *Ibid.*, 2-7.

Routine operations were normally conducted with forces from only one of the ECS by forming task forces and establishing command relationships as required. If an operation threatened to require additional forces from another environment or to extend beyond the capability of the tasked operational commander, a request for forces was made to National Defence Headquarters (NDHQ).[270] The CDS would then assign forces, specify C2 arrangements, and "designate an appropriate commander, most probably one of the operational level commanders."[271] In this process, the ECS were removed from the operational chain of command, only responsible for force generation. As a result, no single commander (other than the CDS) was tasked with domestic operations at the strategic level.[272] Since these contingency operations were dealt with on an ad hoc basis, there was limited opportunity to conduct detailed joint contingency planning. The requirement for a full-time commander of domestic operations to be proactively aware and capable of responding quickly to contingencies was addressed by the creation of Canada Command.

Current Domestic Operations Command and Control

Although Canada Command has many roles, its mission is clear:

Canada COM will conduct operations to detect, deter, prevent, pre-empt and defeat threats and aggression aimed at Canada within the area of responsibility. When requested, Canada COM will provide military assistance to civil

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[270] *Ibid*.

[271] *Ibid*., 12-4.

[272] *Ibid*.

authorities including consequence management, in order to protect and defend Canada.[273]

This means that the command is responsible for all CF operations conducted within Canada, the continental US, Alaska, Mexico, and the approaches to these areas (Canada COM's Area of Responsibility or AOR).[274] To accomplish the mission, the Canadian portion of the AOR has been broken down into six Regional Joint Task Forces (RJTFs): Pacific, West, Central, East, Atlantic, and North. Each region (named Joint Task Force Pacific, Joint Task Force West, etc.) has a permanently established headquarters but is only assigned forces during operations, as described below.[275] These operations are conducted by joint task forces established for a specific purpose and duration. Forces for the RJTFs will be assigned from one or more of the force generators described in the previous section (MARLANT, MARPAC, 1 Cdn Air Div, CFNA, LFWA, LFCA, LFQA, or LFAA) as coordinated with the ECS and other Level 1 organizations.[276] Since the regions are wholly within Canada, operations conducted in the US and Mexico will require either establishment of a new JTF or deployment of one the existing RJTFs.

Since command authorities of forces transferred to the RJTFs are scenario dependent, Canada COM operations are broken down into the following categories[277].

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[273] Department of National Defence, Canada Command – Concept of Operations, Draft Version 3, 3 April 2006, 1-3/5.

[274] *Ibid*., 1-1/5, 1-2/5.

[275] *Ibid*., 5-5/45, 5-6/45.

[276] Department of National Defence, Canada Command Direction for Domestic Operations, Interim Version V1, 1 February 2006, 2-2/6, 2-3/6.

[277] *Ibid*., 1-2/8.

Geographically, operations within Canada and its approaches are *domestic* while all others are *continental*.[278] If an operation is of a predictable, normally recurring nature that can be planned for, it is a *routine* operation whereas operations falling outside this definition are *contingency* operations.[279] Contingency operations are further designated as either *deliberate* or *rapid response* depending on the time available for planning[280] and either *limited* or *complex* depending on whether the operation extends beyond the capability, authority, or AOR of any individual RJTF.[281]

C2 of Canada COM forces depends upon the activity with which the force is employed. Aircraft and resources required to generate air sorties are treated and discussed separately. For land and maritime forces, routine and deliberate contingency operations are carried out by pre-approved force packages. These packages may consist of Rapid Reaction Forces (RRF), which are also available for rapid response contingency operations, or other forces as required.[282] The RRF consist of maritime Ready Duty Ships (RDS), land force Immediate Reaction Units (IRU), and designated alert aircraft. Each of these forces, once prepared, is assigned OPCOM to the Commander Canada COM.[283] When not specifically required for force employment the Commander then delegates OPCON of these forces back to their respective parent force generation command

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[278] DND, Canada Command - CONOPS, 1-3/5.

[279] *Ibid*., 1-4/5.

[280] *Ibid*., 1-5/5.

[281] *Ibid*., Annex A, 1A-10/12.

[282] *Ibid*., 5-5/45, 5-6/45.

[283] *Ibid*., 5-6/45.

(MARPAC, LFWA, etc.). Since, in most cases, the force generation commander is also the RJTF commander, it is a simple matter to keep the forces available for operations when required. In this case, the forces are transferred under OPCON back to the RJTF commander to conduct the specific operation.[284]

The Commander Canada COM and the RJTF Commanders have also been delegated planning authority over all forces (except for those assigned to CEFCOM, CANSOFCOM, and NORAD) within their respective AOR for deliberate and rapid response contingency planning.[285] To aid in this task, the commanders also have TACON of these same forces for the purpose of force protection and changing readiness levels.[286] This allows commanders the flexibility to prepare forces for operations and, therefore, reduce the response time once forces are required.

The final command relationship concerns forces made available for Rapid Response Contingency Operations. If there is a high probability that civilian authorities will seek the assistance of the CF to respond to an event, an RJTF commander may initiate this type of operation. The commander can then assume OPCOM of all CF forces within their respective AOR (less aircraft and NORAD, CEFCOM, and CANSOFCOM forces).[287] The same relationship may also occur at the national level. If the Commander Canada COM declares a National Rapid Response Contingency Operation, he will

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[284] *Ibid*.

[285] *Ibid*., 5-4/45, 5-5-45.

[286] *Ibid*.

[287] *Ibid*., 5-5/45.

assume OPCOM of forces pre-identified and assigned for this purpose.[288] Thus commanders at all levels have been assigned forces under an appropriate command relationship to accomplish their many and varied missions.

Due to their ability for rapid response and the requirement for centralized control, C2 of air assets is slightly different. While the Commander Canada COM has OPCOM over all air assets involved in domestic force employment (except for NORAD and CANSOFCOM operations), he has delegated this authority to the Commander 1 Canadian Air Division who, in this capacity, is referred to as the Canada COM Combined Forces Air Component Commander (CFACC).[289] The Commander 1 Canadian Air Division is thus triple-hatted: as Commander 1 Canadian Air Division, responsible to the Chief of the Air Staff for Canadian aerospace force generation; as Commander Canadian NORAD Region (CANR), responsible to the Commander NORAD for NORAD force employment within CANR; and as the CFACC, responsible to the Commander Canada COM for all other domestic force employment (except for CANSOFCOM operations)[290].

Unlike maritime and land forces, certain alert air assets are assigned OPCON to RJTF commanders permanently.[291] These aircraft are continuously available for routine (such as Search and Rescue) and contingency operations. If additional assets are required by a RJTF, the respective Regional Air Control Element (RACE) will coordinate with the

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[288] *Ibid.*

[289] *Ibid.*, 5-8/45.

[290] *Ibid.*, 4-2/8.

[291] *Ibid.*, 5-11/45.

CFACC and Canada COM to determine how best to accommodate the request.[292] In the case of Rapid Response Contingency Operations, RJTF commanders may assume OPCOM of air force assets within their AOR other than aircraft and those resources necessary for sortie generation.[293]

These C2 relationships can be traced back to specific principles prescribed by the CDS for CF Transformation.[294] These principles include "the development of a command-centric structure; . . . a renewed emphasis on mission command; . . . [and] a clear articulation of command authority, responsibility and accountability."[295] In addition, the Commander Canada COM has articulated 13 mission critical capabilities to ensure successful operations. Of these, *Integrated Command and Control of Operations* is highlighted to "optimize the employment of all available resources in the execution of Canada COM's mission and to provide effective support to other agencies when necessary."[296] These principles and critical capabilities guided planners in the creation of Canada COM and its command relationships to ensure mission success.

CF Doctrinal Analysis of Canada COM Command and Control

The creation and organization of Canada COM certainly follows the principles and guidance published in CF doctrine. At the same time, its creation has produced a

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[292] *Ibid.*, 5-11/45, 5-12/45.

[293] *Ibid.*, 5-11/45.

[294] *Ibid.*, 3-1/4.

[295] *Ibid.*

[296] *Ibid.*, 3-3/4.

need to amend various publications. CF leadership doctrine is well represented as

evidenced by the emphasis on mission command and publication of Commander's

guidance.[297] In addition, many of the principles contained in CF joint operational

doctrine have been incorporated.

CF Operations states that the "planning and control functions of NDHQ in

operations should be confined . . . to the strategic level, leaving operational activities to

the TFC and tactical activities to subordinate commanders."[298] This principle has finally

been realized with the creation of Canada COM. Prior operations were conducted by one

of the formation-based headquarters reporting directly to the CDS. There was no national

operational-level commander to provide coordination of resources throughout the

Canadian AOR. Canada COM fulfils this role.

CF operational doctrine goes on to state that command structures should be

established that clearly define overall command responsibility and delegate the

appropriate level of command authority to subordinate commanders.[299] The clear

assignment of forces, OPCON to either a RJTF commander or a formation-based

headquarters commander, meets the aim of this principle. In addition, RJTF commanders

and their subordinates have the flexibility to employ and protect forces as required as a

result of the delegation of the "necessary decision making authority to the point of

action."[300]

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[297] *Ibid.*, 3-1/4.

[298] DND, *CF Operations*, 1-8.

[299] *Ibid.*

[300] *Ibid.*

The structure of Canada COM adheres to most of the CF principles of command.[301] Unity of command is established by clear cut command relationships depending on whether units are engaged in force generation or force employment. However, this must be tempered by the fact that the RJTF commanders are each part of two separate chains of command, reporting to two different commanders. Prioritizing limited resources could become a problem in this situation. The Commander has limited his span of control to that of the six RJTF commanders and the CFACC. A clear chain of command is created for all forces using the transfer of authority process. Delegation of authority down to the regional and CFACC level has occurred to allow those commanders the freedom of action required to conduct successful operations. Finally, continuity of command is ensured by nominating deputy commanders and establishing necessary contingency plans.

CF doctrinal guidance on the establishment and command of task forces also applies to Canada COM. Although specific command relationships in *CF Operations* will have to be amended, the established process is still valid and observed. Of particular note is the relationship between TFCs and force generators. CF doctrine proscribes that ". . . [t]here must be no confusion regarding the responsibilities assigned to the TFC, the force generators and other agencies involved."[302] For example, in practical terms this requires that all units concerned are aware of when they are working for the Chief of the Land Staff through the Commander LFCA, and when they are working for the Commander Canada COM through the Commander JTFC.

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[301] *Ibid*., 2-3, 2-4.

[302] *Ibid*., 7-4.

Canada COM also caters to the unique aspects of aerospace operations and the slightly different command structure required. One of the tenets of aerospace power, centralized control and decentralized execution, is realized in Canada COM by the designation of the Commander 1 Cdn Air Div as the CFACC. This allows the CFACC to prioritize the weight and balance of effort of scarce aerospace assets in accordance with the guidance and direction received from the Commander Canada COM.[303]

Overall, the creation and structure of Canada COM adheres well to CF doctrine. Since there was not much direction on the C2 of task forces, the Canada COM Concept of Operations had the flexibility to create command relationships that both satisfy doctrine and contribute to operational effectiveness.

Examination of Canada COM using the McCann and Pigeau Framework

McCann and Pigeau readily admit that ". . . [w]e offer only a new framework, not a theory, for discussing C2."[304] Nonetheless the framework provides a number of rich concepts for examining the C2 of a structure or organization. All of the concepts that deal with the establishment of common intent and its subsequent effect on coordinated action are relevant to the analysis.

Canada COM is responsible for a number of routine operations. These tend to be known problems with well-bounded solution spaces. The McCann and Pigeau framework posits that a centralized C2 structure relying on explicit intent is suitable for this type of operation. SAR operations fit this description and Canada COM has well-

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[303] DND, Canada Command - CONOPS, 5-8/45.

[304] Pigeau and McCann, "Establishing Common Intent . . .", 181.

established procedures identifying specific assets and chains of command for this mission.[305] This is an excellent example of the framework's utility in designing C2 arrangements.

Canada COM must also respond to the various contingencies that present the ill-defined, chaotic circumstances that characterize military support to civil authorities. CF support to civil unrest, forest fires, or earthquakes provides uncertain, rapidly changing missions. In these circumstances the McCann and Pigeau framework recommends delegating authority in a decentralized C2 structure to allow freedom of action at the appropriate level. The organization of the RJTFs within Canada COM theoretically addresses this issue. However, except for assigned alert aircraft and in the specific case of a Rapid Response Contingency Operation, the RJTF commanders do not have any forces available to task. Once the decision to allocate forces to the RJTF has been taken (approval authority rests with the Commander Canada COM, CDS, or Minister of National Defence dependant on the category of assistance[306]), the RJTF commander would then have the resources and command authority to allow the necessary freedom of action. Until this situation is rectified, there is a risk of ineffective response to certain contingencies.

The amount of shared explicit and implicit intent is one of the three factors McCann and Pigeau identify as having an impact on achieving coordinated action. A greater level of shared implicit intent facilitates greater common intent and therefore more effective coordinated action. Commander Canada COM has issued extensive guidance to

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[305] DND, Canada Command - CONOPS, 5-16/45 – 5-19/45.

[306] *Ibid*., 5-36/45.

the organization in an effort to establish this shared implicit intent.[307] This guidance

includes explicit statements on the Commander's vision, mission, guiding principles,

objectives, main effort, C2 battle rhythm, and Commander's Critical Information

Requirements (CCIR). This proactive stance towards sharing implicit intent has ensured

that Canada COM and the RJTFs are able to quickly achieve common intent and its

resulting coordinated action.

The examples above provide a clear indication of two results. First, the

establishment and command structure of Canada COM incorporate several of the

McCann and Pigeau C2 framework principles. While there is still room for improvement

concerning delegation of authority, the organization should be able to provide effective

command of domestic operations. Second, the utility of the framework as an analytical

tool has been demonstrated in its application to the newly formed Canada COM. While

the framework was only developed as a model from which to spark further debate, its

usefulness has been demonstrated to go much further.

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[307] Department of National Defence, Commander Canada Command Guidance, 26 July 2006; and DND, Canada Command - CONOPS, 3-1/4 – 3-4/4.

CHAPTER 7 – CONCLUSION AND RECOMMENDATIONS

Military operations will continue to become more complex in the future. As discussed in Chapter Two, this has been the case for decades, if not centuries, and is due in no small part to the uncertainty and chaos that surrounds military action. To address this, one function of a military commander is to establish the processes and structures that contribute to the reduction of this uncertainty while enabling the achievement of some goal or objective. Effective command and control arrangements, as well as supporting doctrine and theory are necessary requirements in the struggle to provide clarity to military operations.

Recently, however, researchers have produced a flood of competing C2 systems, theories, and frameworks. While each one may clarify certain aspects of a problem, the effect of them as a whole is a confusing set of applications and principles that provides sometimes contradictory advice to those seeking guidance on a particular problem. Much of this recent work has been based on the availability of new technology that promises faster, smarter, and more accurate information systems that can either augment or replace human effort.

Military organizations, on the other hand, are faced with the problem of producing effective guidance in the form of doctrine to aid their armed forces in the accomplishment of tasked missions. Chapter Three reviewed American and British C2 doctrine demonstrating the approach each has taken in providing consistent, reinforcing guidance at subsequent subordinate levels of detail. The US, for example, provides very explicit direction on the organization of its various forces and associated command

relationships, while using the theme of 'Unified Action' throughout all of its doctrine to ensure its coherence. British doctrine establishes six key themes that ". . . permeate down through the full hierarchy of doctrine. . . ."[308] Both sets of doctrine also provide extensive direction on task force establishment and organization, especially within multinational operations.

Contrasted with Allied doctrine, Canadian C2 doctrine is disjointed and unstructured. In addition, certain areas of CF doctrine require amendment to ensure alignment not only with other contemporary Canadian doctrine but also that of our closest Allies. Specifically, CF joint operational doctrine was found lacking in its incorporation of principles such as commander's intent, mission command and its shallow treatment of important concepts such as C2 in multinational operations. Although selected portions of CF leadership and environmental doctrine provide references to the McCann and Pigeau framework, a much more cohesive approach would link this subordinate doctrine back to capstone joint doctrine. Unfortunately, as demonstrated in Chapters Four and Five, there is no theme, no 'Canadian approach to warfighting' provided in CF joint doctrine. The C2 principles in this doctrine are promulgated without reference to any Canadian military strategic context and there is no central idea to allow coherence to 'permeate' throughout the doctrine hierarchy.

This shortcoming should be solved by incorporating the McCann and Pigeau C2 framework into Canadian doctrine from the capstone down to the tactical environmental level. Their research firmly places the human, rather than the technological, element back into its rightful place as the most essential component of the C2 landscape. Using the rich

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[308] UK, MoD, *British Defence Doctrine*, 3-10.

concept of shared common intent, McCann and Pigeau have expanded the framework so that it is able to produce guiding principles of effective C2. These principles apply to areas as varied as leadership theory, organizational control, mission command, and coordinated action. Since the framework was developed by Canadian researchers, it is already consistent with Canadian national and military values. Many of the framework's concepts are already promulgated in CF leadership and environmental doctrine and, as demonstrated in Chapters Five and Six, the framework's principles are easily used in the evaluation of current doctrine and command organizations such as Canada COM.

The incorporation of this framework into CF C2 doctrine should be done at the highest level. However, since no superior doctrine to *CF Operations* currently exists, there is also a requirement for the promulgation of a capstone-level CF Doctrine publication. The McCann and Pigeau C2 framework should be established in this publication to allow reference to it in subordinate doctrine. At the same time, *Canadian Forces Operations* must also be revised to incorporate principles of the framework and provide more depth on various subjects as discussed earlier.

Although McCann and Pigeau view their framework as a work in progress, the extensive references already made to it in CF doctrine demonstrate that its principles can be used as basic doctrine. The concepts that it encompasses provide a vast source of ideas and guidance that should be used as the basis for Canadian command and control doctrine. Doing this would stimulate extensive discussion and debate within both the academic and military communities, helping to expand the framework into a complete theory.

Military forces rely on doctrine to provide fundamental guidance to establish military capabilities. Command and control doctrine should provide principles that assist

commanders to reduce the uncertainty and chaos that characterize military operations. To be effective, this doctrine needs to contain central themes or ideas that reinforce key messages throughout the hierarchy, from the strategic to the tactical level. Canadian Forces C2 doctrine does not currently accomplish this. Incorporation of the McCann and Pigeau C2 framework as the foundation of CF C2 doctrine will provide the fundamental guidance that enables commanders to reduce the 'fog of war' and successfully achieve their objectives.

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