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Allan English and Colonel John Westrop (Retired)

Canadian Air Force

Leadership and Command

THE HUMAN DIMENSION OF EXPEDITIONARY AIR FORCE OPERATIONS



Canada

**CANADIAN AIR FORCE
LEADERSHIP AND COMMAND:
THE HUMAN DIMENSION OF
EXPEDITIONARY AIR FORCE OPERATIONS**

Dr Allan English and Colonel John Westrop (retired)

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Foreword

Air forces are, by their very nature, technology oriented institutions that exist to exercise aerospace power on behalf of the nation over the entire spectrum of conflict. Yet, while it is true that advances in technology influence how air forces wage war, it is also true that wars are won or lost by people. History has repeatedly demonstrated that success or failure is largely determined by the judgement of commanders as well as the motivation and training of the airmen and women who answer the call to serve their nation. Thus, a sound understanding of the human dimension of air force operations in general, and specifically of air force command and leadership is essential to our future success.

Much has been written on the subject of leadership and command over the years but it is only recently that published works have undertaken to treat the subject from a Canadian perspective. Of these, few have thus far undertaken to understand our unique air force culture, leadership styles and command concepts. This work, which is based on Defence Research and Development Canada research into the human dimension of expeditionary aerospace operations, seeks to begin to address this deficiency.

The Canadian Forces Aerospace Warfare Centre was created in 2005 to ensure the evolution of aerospace power knowledge in Canada by becoming the engine of transformation for the Canadian Air Force. Accordingly, this book is published to further our understanding of a critical component of the human dimension of aerospace power—Canadian Air Force leadership and command.

Colonel J.F. Cottingham
Commanding Officer,
Canadian Forces Aerospace Warfare Centre

Preface

This book is based on a report written in support of the Defence Research and Development Canada (DRDC) project “The Human Dimension of the Expeditionary Air Force,” which is investigating the leadership and sustainment of teams in the Air Force. The project’s research is focussed particularly on those teams composed of individuals from different military occupations and from different backgrounds that are formed to conduct operations. It was decided to publish the report’s findings in book format to make them more accessible to: those interested in Canadian Air Force leadership and command; those writing doctrine; and those engaged in professional military education.

Canadian Forces (CF) leadership doctrine, in *Duty with Honour* and *Leadership in the CF: Conceptual Foundations*, recognizes that, because of the unique physical environments in which the Canadian Army, Navy and Air Force operate, they each have a unique body of professional knowledge, experience, and, therefore, culture. Furthermore, it is recognized that the three Environments of the CF manifest certain elements of the CF’s ethos in different ways, for example, in leadership styles and command arrangements. Unfortunately for the Canadian Air Force, very little has been written about how its culture and professional working environment have influenced the development of unique Canadian Air Force leadership styles and command arrangements.

At the start of this project, it was realized that in order to conduct this research a comprehensive understanding of leadership and command aspects of Air Force operations, both historical and contemporary, was needed because they helped to shape Air Force culture and identity. In turn, operations, culture and identity have influenced Air Force team and leadership structures, characteristics. Moreover, detailed information on Air Force team and leadership structures; the characteristics and tasks of the various Air Force communities; and an analysis of those factors that impact on Air Force operations, to include operations that are expeditionary, deployed and at static bases, was required to support this research. Therefore, this book was written to provide a description and analysis of these issues and it is designed to provide the foundation for understanding these issues and how they impact upon leading and sustaining teams in the Air Force today.

Furthermore, many of the problems identified in this study were caused by a lack of coherent Air Force doctrine, particularly doctrine related to leadership and command and control. In order to effectively rectify these problems, Canada’s Air Force requires an overarching model of command and control, a detailed understanding of historical and contemporary models of air force command and control, and personnel with the ability to apply consistently modern theories of command and control. This book aims to contribute to this requirement by providing a foundation for debate and research in these areas.

The authors are very grateful for the support and assistance of Dr Angela Febbraro of DRDC – Toronto and LCol Marty Playford 1 Canadian Air Division in the production of this work. Their contributions were essential to seeing this work come to fruition.

Allan English
John Westrop

Chapter 1

Introduction

At the beginning of the 21st century, the Canadian Forces (CF) is engaged in operations around the world on a scale and at a tempo that is extremely demanding for the CF. At the same time, the CF is undergoing a major transformation in organizational focus and structure. The combination of high tempo operations and transformation poses many challenges for the CF. In order to meet these challenges successfully, the CF requires a detailed understanding of leadership and command as they are practised in the profession of arms. The CF has taken a number of steps to acquire this understanding, including the publication of the profession of arms manual, *Duty with Honour*, and a series titled *Leadership in the Canadian Forces*.

In these publications, the CF has recognized that, because of the unique physical environments in which the Canadian Army, Navy and Air Force operate, they each have a unique body of professional knowledge,¹ experience, and, therefore, culture. Despite the many cultural similarities among the CF Environments, *Duty with Honour* acknowledges that differences among the three CF Environments are “essential for readiness, generating force and sustaining a multi-purpose, combat-capable force.”² Furthermore, these differences account for why “all three Environments often manifest certain elements of the [CF’s] ethos in different ways; for example, the influence of history, heritage and tradition or how team spirit is promoted and manifested.”³ Consequently, *Leadership in the CF: Conceptual Foundations* (hereafter *Conceptual Foundations*) recognizes that “leaders are formed and conditioned by their social environment and culture.”⁴ We can, therefore, expect to see differences in leadership styles and command arrangements in the Canadian Army, Navy and Air Force based on these environmental differences in professional expertise and culture.

Unfortunately for the Canadian Air Force, very little has been written about how its culture and professional working environment have influenced the development of unique Canadian air force leadership styles and command arrangements. The official histories of the air force, written by the Department of National Defence’s Directorate of History and Heritage, as well as a great deal of other secondary source literature, provide much of the basic information required to understand these issues from the origins of powered flight at the beginning of the 20th century to the end of the Second World War. But these histories do not focus on Canadian air force culture and identity, team and leadership structures, or characteristics and tasks. Furthermore, with the cancellation of the post-Second World War air force history, no comprehensive study of Canada’s air forces in the post-1945 period has been undertaken.

Therefore, this book has been written to provide a description and analysis of certain aspects of Canadian air force culture and identity, team and leadership structures, and command arrangements from their origins to the present day. This work is designed to provide the foundation for understanding these issues and how they impact upon leading and sustaining teams in the Air Force today, including the Air Force Reserve, and to include operations that

1 DND, *Duty with Honour: The Profession of Arms in Canada* (Kingston, ON: CF Leadership Institute, 2003), 51, 59.

2 Ibid., 74.

3 Ibid., 25.

4 DND, *Leadership in the Canadian Forces: Conceptual Foundations* (Kingston, ON: Canadian Defence Academy, 2005), 4.

are expeditionary and deployed as well as those conducted from static bases. In addition, this book will address some of the issues identified in three recent reports on aspects of Air Force leadership.⁵ The report's findings were published in book format to make them more accessible to: those interested in Canadian Air Force leadership and command; those writing doctrine; and those engaged in professional military education.

This book, and the report on which it is based, support the Defence Research and Development Canada (DRDC) project "The Human Dimension of the Expeditionary Air Force," which will be investigating the leadership and sustainment of multifunctional or diverse teams in the Air Force. This project responds to Strategic Vectors 2 (Responsive Expeditionary Capability), 5 (Transformation-enabling Leadership), and 6 (Multi-skilled, Well-educated People) in the Air Force's strategic transformation vision, which was designed to transform it into an expeditionary air force.⁶

The CF's and the Air Force's new focus on expeditionary operations has raised a number of questions about the nature of expeditionary operations because expeditionary forces must be more robust and must have the ability to sustain themselves for longer periods of time than has typically been the case with forces sent on deployment.⁷ These characteristics of expeditionary forces produce unique challenges for leaders. Therefore, "The Human Dimension of the Expeditionary Air Force" project addresses two key issues that must be understood clearly if leaders of expeditionary air forces are to meet their challenges successfully: (1) leading teams, and (2) sustaining teams. In terms of *leading Air Force teams*, the project will include an analysis of team and leadership structures and of characteristics and tasks in Air Force communities (e.g., support, fighter, transport, maritime, tactical helicopter, maintenance), both deployed and at home. It will also identify teams and leaders for particular focus, including Reserve Forces. And finally, it will determine effective leadership approaches that can be used with teams on expeditionary operations. These leadership approaches may include transformational leadership models to reinforce common identity, values and ethos, as well as other leadership models in the context of multifunctional and diverse teams. In terms of *sustaining Air Force teams*, the project will characterize the expeditionary operations cycle for Air Force personnel, and seek to improve the effectiveness of Air Force expeditionary teams.

This book begins with three chapters that provide the historical context necessary to understand Canadian air force culture and identity, team and leadership structures, and command arrangements. Chapter 2 briefly examines the history of Canada's air force from its beginnings in the First World War to 1968, the year in which the Royal Canadian Air Force was disbanded as a separate service and its constituent parts became part of the unified Canadian Forces. During this time, the foundations of air force culture in Canada were laid, fundamental lessons regarding air force leadership and command and control (C²) were learned, and the Canadian air force gained considerable experience in organizing

5 The three reports are: Wendy Sullivan-Kwantes, Angela R. Febraro, and Ann-Renee Blais, "Air Force Deployment Reintegration Research: Implications for Leadership," Defence R&D Canada – Toronto, Technical Report TR 2004-149 (27 September 2004) and Air Force Deployment Reintegration: A Qualitative Study," Defence R&D Canada – Toronto, Technical Report TR 2005-159 (1 December 2005); and Allan English, "Survey of Current Leader Development in the Air Force," report written for Defence Research and Development Canada, dated 17 March 2004.

6 Canada, Department of National Defence (DND), *Strategic Vectors: The Air Force Transformation Vision* (Ottawa: Director General Air Force Development), 1, 44-51, available at www.airforce.forces.gc.ca/vision/strategic_e.asp. Accessed 29 Nov 2006.

7 See Allan D. English, ed., *Canadian Expeditionary Air Forces*. Proceedings of the 2003 Air Symposium held at the Canadian Forces College, Bison Paper 5 (Winnipeg: Centre for Defence and Security Studies, 2004) for detailed discussions of these issues.

and employing large expeditionary forces. Many of the experiences from these formative years of Canada's air force continue to have relevance for air operations today. Chapter 3 examines the early years of unification from 1968-1975, when Canada's air resources were dispersed throughout the unified CF. Without strategic-level oversight and leadership, the CF air element suffered from declining esprit de corps and serious professional development and doctrinal deficiencies. Attempts to address these problems began with the creation of Air Command in 1975. Chapter 4 examines these attempts, in the period 1975 to today, and provides an analysis of the various re-structuring and reorganizing initiatives in that era. Chapters 3 and 4 conclude that during the almost 40 years since the unification of the CF, the command structure of Canada's air forces has been subjected to a series of ad hoc, expedient changes that have resulted in disjointed, sometimes dysfunctional, C² arrangements that continue to plague the Canadian Air Force to this day. The problems with these C² arrangements have been exacerbated by the emphasis in the CF and the Air Force in the post-Cold War era on expeditionary operations.

Many of these problems were caused by a lack of coherent Air Force doctrine, particularly doctrine related to leadership and command and control. In order to effectively rectify these problems, Canada's Air Force requires an overarching model of command and control, a detailed understanding of historical and contemporary models of air force command and control, and personnel with the ability to apply consistently modern theories of command and control. Therefore, Chapters 5 and 6 provide an overview of leadership and command and control issues and models that are relevant to addressing current and future challenges in Canadian Air Force leadership and command and control, particularly those related to expeditionary operations, with a view to stimulating debate and research in these areas.

The study of Canadian Air Force leadership and command is complicated by the variety of communities that make up the Air Force and the subcultures that exist within those communities. While air forces, since their earliest days, have always consisted of an amalgam of groups with their distinct subcultures, little has been written about this facet of air forces. The final chapter examines the communities that comprise today's Air Force, based on inputs from each community, with a focus on specific aspects of these communities that have a direct effect on Canadian Air Force leadership and command. Annex A provides the reader with a convenient summary of research recommendations from Chapters 5, 6 and 7.

Chapter 2

Canada's Air Force from its Beginnings to 1968: Leadership and Command Foundations for Expeditionary Operations

Introduction

From inauspicious beginnings in 1914, as the Canadian Aviation Corps comprised of three personnel and one aircraft, Canada's air forces emerged at the end of Second World War, forty years later, as the fourth largest Allied air force, with over 200,000 personnel and 78 squadrons equipped with the latest aircraft. Reduced to a token force in the post-Second World War demobilization rush, the Royal Canadian Air Force (RCAF) expanded once again to meet the challenges of the Cold War to become a major air force. At its post-war zenith in the mid-1950s, the RCAF reached a peak establishment with 54,000 personnel and over 3,000 aircraft in 41 squadrons based both in Canada and deployed overseas.¹ In succeeding years it underwent incremental reductions, until it was disbanded as a separate military service in 1968, and its forces were amalgamated with those of the Royal Canadian Navy (RCN) and Canadian Army into the unified Canadian Forces.²

During these first 54 years of air force history, the foundations of air force culture were laid and a number of important air force leadership and command and control lessons emerged. This chapter will give an overview of those years to provide an understanding of how the foundations of air force culture in Canada were laid, the context in which fundamental lessons regarding air force leadership and command and control were learned, and an overview of the experience the Canadian air force gained in organizing and employing large expeditionary forces. The experiences from these formative years of Canada's air force continue to have relevance for air operations today, and will be used to put the discussions in the chapters on air force leadership and command into perspective.

The Origins of Canada's Air Force

False Start – The Canadian Aviation Corps – 1914–15.³ Powered flight is a 20th century innovation, beginning when the Wright Brothers made the first controlled, sustained flights in a power-driven airplane in December 1903 near Kitty Hawk, North Carolina. The first successful Canadian powered flight was made by J.A.D. McCurdy in February 1909 when he piloted his biplane, the "Silver Dart," for half a mile over the ice-covered surface of Baddeck Bay, Nova Scotia. The next day McCurdy made a longer flight, flying four miles in a complete circle. These flights were recognized by the Royal Aero Club of the United Kingdom as the first successful heavier-than-air flights by a British subject anywhere in the British Empire.⁴

1 Samuel Kostenuk and John Griffin, *RCAF Squadron Histories and Aircraft 1924-1968* (Toronto: Samuel Stevens Hakkert and Co., 1977), 144.

2 The terms Canadian Forces (CF) and Canadian Armed Forces (CAF) are used interchangeably. According to Queens Regulations and Orders for the Canadian Forces (QR&Os), Section 14 of the *National Defence Act* defines "Canadian Forces" as: "...the Armed Forces of Her Majesty raised by Canada and consisting of one Service called the Canadian Armed Forces." QR&O 2.01 (1).

3 For more details of this period see S. F. Wise, *The Official History of the Royal Canadian Air Force. Vol. 1: Canadian Airmen and the First World War* (Toronto: Univ. of Toronto Press, 1980), 25-30.

4 Larry Milberry, *Aviation in Canada* (Toronto: McGraw-Hill Ryerson, 1979), 13-14.

McCurdy and his associates formed the Canadian Aerodrome Company and sought to interest the Department of Militia and Defence in possible military applications for aircraft. During the annual militia training camp at Petawawa, they made four demonstration flights, but the Silver Dart was wrecked in a heavy landing on the final flight. Militia Department officials who witnessed these flights were unimpressed, and decided to await the outcome of similar tests being conducted in Britain. Over the next few years repeated attempts to have the Militia Department form an aviation section were rejected because there were no funds available for this innovation. When the First World War began, Canada had neither aircraft nor pilots in its armed forces.⁵

When Canada entered the war in August 1914, a number of European nations were already employing aircraft in their armed forces. The British War Office had created an Air Battalion in 1911, which became the Royal Flying Corps (RFC) in April 1913, while the Admiralty created the Royal Naval Air Service (RNAS) in July 1914. Colonel Sam Hughes, the Minister of Militia and Defence was personally supervising the assembly and dispatch of the Canadian Expeditionary Force⁶ (CEF) for service overseas, and queried the British War Office on the requirement for aviators. Hughes was advised that six aviators were required immediately; however, no trained aviators could be found in Canada to meet this requirement.

Hughes did approve the formation of a small Canadian aviation unit to accompany the CEF to England, and in September 1914 the Canadian Aviation Corps (CAC) was created. It was to consist of two officers and one mechanic, and it was authorized to spend not more than \$5000 for the purchase of a suitable aircraft. The provisional commander of the CAC was able to locate and purchase a bi-plane from the Burgess-Dunne Company of Massachusetts, and arranged for its delivery to Quebec City, where it was loaded on one of the ships transporting the CEF to Britain. The aircraft arrived in Britain with its crew in October 1914.

The Burgess-Dunne was never to fly, however, as none of the three members of the CAC was a qualified pilot. It was left lying in the elements at the Canadian camp on the Salisbury Plains, and quickly deteriorated until it was non-operational. By May 1915, the Canadian Aviation Corps ceased to exist, and Canada's first foray into military aviation and expeditionary operations had come to an ignominious end. The failure of this modest aviation undertaking provides an early indication of the difficulties in forming and deploying an expeditionary air force, and illustrates the importance of properly trained personnel and suitable equipment for the support of aircraft in ensuring the success of such an undertaking.

The Canadian Contribution to the War in the Air. However, despite the failure of the CAC, Canadians made a substantial contribution to the British flying services. By the end of the war about 25 percent of all RAF flying personnel and perhaps 40 percent of RAF pilots on the Western Front were Canadian.⁷ Furthermore, Canadians made a substantial contribution to the British war in the air. Canadian fighter aces like Billy Bishop and Raymond Collishaw were among the 127 Canadian aces in the imperial flying services

⁵ Kostenuk and Griffin, *RCAF Squadron Histories and Aircraft*, 1.

⁶ For a detailed discussion of expeditionary forces in an air force context see Thierry Gongora, "The Meaning of Expeditionary Operations from an Air Force Perspective," in Allan D. English, ed., *Canadian Expeditionary Air Forces*, proceedings of the 2003 Air Symposium held at the Canadian Forces College, Bison Paper 5 (Winnipeg: Centre for Defence and Security Studies, 2004), 21-34.

⁷ Wise, *Canadian Airmen and the First World War*, 597.

who accounted for a staggering 1,500 victories in that war.⁸ In fact the top ten Canadian aces accounted for 462 enemy aircraft, a significant portion of the British Empire's total.⁹ By accounting for this many kills, the Canadian fliers established a reputation for their country out of all proportion to the number of them in the British air services.

Canadians also played a significant role unlocking the trench deadlock. The First World War was an artillery war and by 1916, without aircraft, the guns were blind and not particularly effective. At Vimy Ridge (April 1917), the Canadian Corps used aerial photos and observation aircraft, among other means, to locate and to call fire down upon enemy batteries; 180 of 212 German batteries were identified, most of which were silenced before the offensive began.¹⁰

During the final months of the First World War, Canadians were at the forefront of the evolution of the co-ordination of air and land forces particularly in the mobile warfare of the last 100 Days. For example, the last major assault of the war for the Canadian Corps was at Valenciennes on 1 November 1918. Heavy fire from German artillery was quickly silenced by counter-battery fire directed by aircraft and German anti-tank guns were destroyed by aircraft. Much of this co-ordination of air and land forces was carried out by the Canadian Corps' Counter Battery Office which not only directed artillery fire but also had "operational direction [control]" of the day bombers of 10 (Army) Wing to engage targets that could not be effectively engaged by the artillery.¹¹ Much of the innovative work of the Counter Battery Office of the Canadian Corps was done under the direction of LCol A.G.L. McNaughton, who was succeeded as counter-battery officer by LCol H.D.G. Crerar, both of whom would command the First Canadian Army in the Second World War.¹²

RFC/RAF Training in Canada – 1917–18.¹³ After the demise of the Canadian Aviation Corps, three years elapsed before any further action was taken to form a Canadian air force; however, in the interval Canadians became fully engaged in the British flying services. From the beginning of the war, Britain's Royal Flying Corps and Royal Naval Air Service, and after 1918 Royal Air Force (RAF), viewed the Dominions as a fertile source of recruits, and enrolled many Canadians. Initially, the two services accepted only applicants who were qualified pilots. However, there were very few trained pilots available, and the hundreds of young Canadians who sought to volunteer for the RFC and RNAS were first required to enter a civilian flying school to obtain the necessary training at their own expense. A number of volunteers enrolled in the Curtiss School of Aviation in Toronto, which graduated 129 pilots in 1915 and 1916.¹⁴

As the war entered its third year, it became apparent that civilian schools could not meet the demands for aircrew of the rapidly expanding British air services, and in 1917 the RFC asked for permission to set up its own training establishment in Canada. In the absence of any Canadian capability to train aircrew, the Canadian government approved the RFC's request. The RFC plan was ambitious, and called for the formation of four training stations,

8 Dan McCaffery, *Air Aces: The Lives and Times of Twelve Canadian Fighter Pilots* (Toronto: Lorimer, 1990), 1.

9 Denis Winter, *The First of the Few* (Athens, GA: Univ. of Georgia Press, 1983), 22.

10 Wise, *Canadian Airmen and the First World War*, 401, 409.

11 W.A.B. Douglas, *The Official History of the Royal Canadian Air Force. Vol. 2: The Creation of a National Air Force* (Toronto: Univ. of Toronto Press, 1986), 569.

12 Wise, *Canadian Airmen and the First World War*, 559-60.

13 For more details on this topic see Hugh Halliday and Laura Brandon, *Pilot Training in Canada, 1917-18*. Canadian War Museum. www.warmuseum.ca/cwm/disp/dis002_e.html. Accessed 29 Nov 2006; Wise, *Canadian Airmen and the First World War*, 76-120; and Allan English, *The Cream of the Crop: Canadian Aircrew 1939-1945* (McGill-Queen's Univ. Press, 1996), 42-8.

14 Kostenuk and Griffin, *RCAF Squadron Histories and Aircraft*, 6.

each with one or more aerodromes. The stations would have five training squadrons equipped with the Curtiss JN-4 “Canuck” aircraft manufactured in Canada. Following consultation with Canadian officials, the plan was reduced to three stations: RFC Station Camp Borden was the main training site with five squadrons plus a school of aerial gunnery; RFC Station Deseronto with aerodromes at Mohawk and Rathburn; and, RFC Station North Toronto with aerodromes at Long Beach, Leaside and Armour Heights.

When the Armistice was signed on 11 November 1918, the RAF training organization in Canada had a total strength of 11,928. This included a staff of 993 officers and 6,158 other ranks, and 4,777 personnel (aircrew and ground crew) under training. During its 21 months of operation in Canada it had enlisted a total of 16,663 personnel (9,200 flight cadets and 7,463 mechanics) and graduated 3,135 pilots and 137 observers. These predominantly Canadian personnel served with the British air services during the war, and provided a pool of trained personnel for recruiting into the post-war Canadian Air Force. Canada (through the RFC [later RAF] Canada) became a world leader in aircrew training in the First World War. By sending 200 pilots per month to Britain, a Dominion with less than 10 percent of the Empire’s population¹⁵ produced at least 20 percent of the aircrew reinforcement needs of the British Empire, and, by November 1918, two-thirds of the staff and 70 percent of the flying positions of the RAF Canada were filled by Canadians.¹⁶ The RFC/RAF Canada was commanded by a British officer and Canadians gradually filled more responsible positions as the organization grew and Canadian officers gained experience. Some Canadians did however command air training organizations in the First World War. In 1918 the Training Division, one of the largest aircrew training organizations in Britain (about 20,000 all ranks), was commanded by the highest ranking Canadian in RAF, the 28 year old Brigadier General A.C. Critchley¹⁷

Canadian expertise in aircrew training was also recognized by its closest neighbour. As late as April 1917 (the month the US entered the First World War), there were only 52 trained fliers in the Aviation Section of the US Army Signal Corps; by war’s end there were over 16,000 flyers in the United States Army Air Corps.¹⁸ The American expansion was given a running start by the RFC Canada when it gave briefings and instructional material to those in charge of starting a large scale American flying training program. Ten days after their visit to RFC Canada facilities American officials began their own program using many of the methods and materials borrowed from Canada.¹⁹

The success of the RFC/RAF Canada training organization established a precedent for the British Commonwealth Air Training Plan (BCATP) of 1939–45 and the for the North Atlantic Treaty Organization (NATO) aircrew training program of the 1950s.

The Canadian Air Force (England) – 1918–20.²⁰ Despite a suggestion made by the British Army Council in 1915 that the Dominion of Canada should raise a complete air unit for service with the RFC, no action was taken by Canada on this matter until the spring of 1918. In the summer of that year, following lengthy bilateral negotiations, the Air Ministry authorized the formation of two Canadian squadrons within the RAF, one fighter and one day-bombing. The Canadian Privy Council approved the formation of the Canadian Air

15 Winter, *The First of the Few*, 21.

16 Wise, *Canadian Airmen and the First World War*, 113, 117-8.

17 Wise, *Canadian Airmen and the First World War*, 597; and Alfred C. Critchley, *Critch!: the Memoirs of A.C. Critchley* (London: Hutchinson, 1961), 88.

18 English, *The Cream of the Crop*, 25.

19 Hiram Bingham, *An Explorer in the Air Service* (New Haven: Yale Univ. Press, 1920), 11-22.

20 For more details on this topic see Wise, *Canadian Airmen and the First World War*, 579-611.

Force (CAF) in England, and established an Air Force section within the General Staff of the Overseas Military Forces of Canada, re-titled as the Directorate of Air Services in February 1919.

The two Canadian squadrons were formed in November 1918: No. 1 Squadron CAF as a scout (fighter) unit and No. 2 Squadron CAF as a day bombing unit. Aircrew for the new CAF squadrons were drawn primarily from Canadian personnel already serving with RAF squadrons. Due to a lack of trained Canadian groundcrew in the RAF, a Canadian Air Force detachment was created at the RAF School of Technical Training to train CEF (army) personnel in air force groundcrew trades. In March 1919 a CAF wing headquarters was created to administer the two squadrons. It was administratively responsible to the Directorate of Air Services, but under the operational control of No. 2 Group of RAF Home Command.²¹

Having created a modest expeditionary Canadian Air Force too late to see action in the First World War, the Canadian government then decided that it did not wish to maintain a peacetime air force in Canada. Orders directing all flying to cease and for all aircraft and equipment belonging to the Canadian government to be packed for shipment to Canada reached England in June 1919. The two squadrons, wing headquarters and Directorate of Air Services were progressively disbanded in early 1920. Thus ended the history of Canada's second military aviation force, once again an expeditionary air force, but one far more professional and capable than its predecessor.

The short-lived but robust Canadian Air Force (England) was organized on the RAF model, and used the air force organizational structure of squadrons, wings, groups and commands which would be followed in developing Canadian air forces in the future. In this model, the squadron is the basic air force operational unit. Squadrons are created to carry out a specific air power function, (e.g., "bombing" or "reconnaissance"), and are usually equipped with aircraft optimized for that function. Squadrons normally include both air and groundcrew, are generally self-sufficient, and can be deployed and re-deployed as operational conditions dictate.

In the RAF organizational model, the squadron is also the fundamental building block of the air force command and control organization. Several squadrons with similar roles can be combined into formations called "Wings," and these can be grouped into larger formations called "Groups," all reporting to a senior air force "Command." The Canadian Air Force (England) command and control arrangements were somewhat unique in establishing and distinguishing between administrative and operational authority. While administrative control of CAF units was retained by the CAF though the Directorate of Air Services, operational control was vested in the RAF. Whether intended or not, this created the precedent of placing Canadian aviation units under foreign operational control, while retaining administrative control through national authorities, a practice that would be repeated in the Second World War and in post-war multi-national operations.

The Air Board and the Canadian Air Force – 1920–23.²² After the war, there was considerable debate in Canada over the direction to be taken by the government in developing aviation, and in particular on the balance between civil and military aviation. As a preliminary step, in June 1919 the Government established an Air Board (patterned on the British Air Ministry) to regulate and control aviation throughout Canada. The Air Board structure was to include three divisions: a Civil Aviation Branch (for the control of commercial and civil flying); a Civil Operations Branch (responsible for all non-military

21 Kostenuk and Griffin, *RCAF Squadron Histories and Aircraft*, 4-7.

22 For more details on this period see Douglas, *The Creation of a National Air Force*, 33-72.

flying operations); and a Canadian Air Force (responsible for military flying training, rather than defence).²³ The British Air Ministry provided substantial encouragement, including approximately five million dollars worth of equipment as a gift.²⁴

John Wilson, the first Secretary of Canada's Air Board, believed that a nation's air power should be defined in its broadest terms to include a viable commercial sector, a healthy aircraft manufacturing industry, widespread training and instructional facilities, technical research, and an active program of experimental flying activities. In organizing the Air Board to act as an umbrella body to supervise all these activities, Wilson was influenced by his experience as assistant deputy minister of the Naval Service before the war. He described the pre-war Royal Canadian Navy as "a house built on sand with no permanence" because without a solid civil foundation the RCN was unable "to muster the... support needed to prosper; consequently, it remained an artificial construct imposed on a disinterested public, fighting a continual rearguard action for survival." Based on this logic, the CAF was designed to provide training to the thousands of wartime aircrew who would then form the basis for a small non-permanent, and therefore relatively inexpensive, "air militia" that could be used for civil tasks or in emergencies.²⁵

The new CAF was authorized by an Order-in-Council in February 1920 and was given a provisional establishment of six officers and men with temporary rank. The CAF was designed as a non-permanent organization, with its only function to give 28 day refresher courses, every other year, to former officers and airmen who had served in the British and Canadian air services during the war. A CAF Association was also established, with branches in all provinces, to maintain a roster and to select qualified personnel for refresher training. The total number of Canadians who flew with the British air services, RFC, RNAS and RAF, and, therefore potentially available to serve in the post-war "air militia" has been estimated at more than 23,000.²⁶

A small CAF headquarters was set up in Ottawa, and Camp Borden was taken over to serve as the CAF training centre. Training began there in October 1920 using the hangars and facilities erected by the RAF for its Canadian training program and using the aircraft and other equipment donated by the British government. By the spring of 1922 it had become obvious that the practice of maintaining a non-permanent air force, that only gave refresher courses to experienced wartime aircrew, was not adequate to develop an effective military force. New pilots were not being trained and operational units did not exist. It was therefore decided to reorganize the CAF on a more permanent basis. The first stage of this reorganization, initiated by the Air Board in June 1922, saw the consolidation of the Civil Operations Branch and the Canadian Air Force into a single organization.

Further reorganization occurred when the National Defence Act came into effect on 1 January 1923, putting the departments of Militia and Defence, the Naval Service and the Air Board under a single Minister of National Defence. Within the new Department of National Defence, the CAF was now to be responsible for all government flying operations and for the control of civil aviation. It was headed by a director, and organized into three branches under assistant directors. These branches were Organization (training, operations and personnel); Technical (supply and transport); and Civil Aviation (civil staff, estimates and liaison with other government departments).²⁷

23 Kostenuk and Griffin, *RCAF Squadron Histories and Aircraft*, 11.

24 Wise, *Canadian Airmen and the First World War*, 614.

25 Douglas, *The Creation of a National Air Force*, 35, 43. Quote from p. 43.

26 Kostenuk and Griffin, *RCAF Squadron Histories and Aircraft*, 5.

27 Larry Milberry, *Sixty Years: the RCAF and Air Command 1924-84* (Toronto: CANAV Books, 1984), 21.

While this was a transitional period in the history of the air force in Canada, there were also aviation milestones of note. The first trans-Canada flight was made in 1920; it started in Halifax, and using relays of Civil Operations Branch and CAF aircraft and crews, it ended in Vancouver ten days later. The Air Board CAF also took an early interest in Arctic flying, and submitted a comprehensive report on the possibilities of flying operations in northern Canada.

The RCAF – 1 April 1924.²⁸ In conjunction with the reorganization of the CAF, formal application was made in 1923 to King George V to add the prefix “Royal” to the title of the Canadian Air Force. Permission was granted and took effect on 1 April 1924, when the RCAF came into being as a permanent component of Canada’s defence forces. Under the new organization the RCAF was administered by a director responsible to the Army’s Chief of the General Staff, but it now comprised two components—a Permanent Active Air Force (PAAF) and a Non-Permanent Active Air Force (NPAAF). The PAAF was the corps of personnel on permanent duty for employment as required, including training the NPAAF. The NPAAF consisted of units and detachments that the Governor-in-Council could form, although none were organized for another eight years.²⁹ The authorized establishment of the Permanent Force was a modest 68 officers and 307 airmen.³⁰

A new organizational structure for the RCAF was approved in 1925 that provided for service squadrons to fulfil the operational requirements of the various government departments. The new organization included: RCAF Headquarters (Ottawa); a Flying Training Station (Camp Borden); an Operations Wing (Winnipeg); and five operations squadrons located across the country. Over the next eight years the RCAF expanded slowly but steadily. New stations were opened, including Trenton as the major air centre to replace Camp Borden, whose 1917 vintage buildings were deteriorating rapidly. There was also significant infusion of new blood into the Air Force. In May 1923, while the re-organization of the RCAF was still being formulated, the first course of cadets (or Provisional Pilot Officers) began training at Camp Borden—the first new service pilots to be trained in Canada since November 1918. In 1926, a class of NCOs began training as pilots, and in 1927 a technical training scheme was started to supply skilled tradesmen for the Air Force.

The RCAF of this period was unique among the air forces of the world in that the greater part of its work was essentially non-military in character. As successor to the Civil Operations Branch, it took over the Air Board’s original six stations, as well as its mandate as the government’s civil aviation agency. The RCAF performed many valuable government air functions: it photographed great areas of Canada; opened up new sections of the interior; transported officials into inaccessible regions; blazed air routes; patrolled forests and fisheries; assisted in the suppression of smuggling; and experimented in providing air mail services.

Reorganization 1927 – Directorate of Civil Government Air Operations.³¹ In 1927, strong opposition to the RCAF as a military organization carrying out government civil air operations came to a head. As a result, the Directorate of Civil Government Air Operations (DCGAO) was created to administer and control all air operations (other than those of a military nature) carried out by government aircraft. It was also tasked to control and administer units, detachments and formations of the RCAF that were placed under its control. The organizational structure was confused, however, because although DCGAO was nominally a

²⁸ For more details see Douglas, *The Creation of a National Air Force*, 60-4.

²⁹ Milberry, *Sixty Years*, 23.

³⁰ Kostenuk and Griffin, *RCAF Squadron Histories and Aircraft*, 11.

³¹ For more details see Douglas, *The Creation of a National Air Force*, 76-81, 91-118.

civil organization, it reported to the Deputy Minister of National Defence and it was staffed primarily by RCAF personnel who were seconded or attached to the new Directorate.

The DCGAO was organized into air stations with attached detachments. All operational flying units of the RCAF were transferred to DCGAO; however, virtually all the aircraft and operational personnel for the DCGAO branch came from the RCAF, and for years the bulk of RCAF flying was done in executing DCGAO duties. With the stand-up of the DCGAO, the RCAF establishment was reduced to a headquarters (RCAF Headquarters, Ottawa); two training stations (RCAF Stations Borden and Vancouver), and five training squadrons.³²

Since its inception in 1924, the RCAF had been almost fully occupied with the government's civil flying operations. The reorganization of 1927 resulted only in the creation of a nominally civilian organization within the RCAF to perform these tasks and while the reorganization "produced considerable shuffling of offices and appointments, its effect on flying operations was more apparent than real."³³ The real effects on flying operations came in the early 1930s when, as a result of funding limitations caused by the Depression, civil operations came almost to a standstill. Nonetheless, the RCAF did create a "joint" ("integrated" in today's parlance) headquarters with the Royal Canadian Mounted Police (RCMP) and it established two new squadrons, a Flying Boat squadron based at Vancouver (in February 1933) and a Flying Boat squadron based at Dartmouth (in April 1934), to assist the RCMP in its efforts to reduce smuggling off Canada's coasts.

Reorganization as a Military Force.³⁴ In 1936, as war clouds began to appear on the horizon, it was decided that the RCAF should be reorganized as a purely military organization. To facilitate this change, a Department of Transport (DOT) was created to take over responsibility for civil aviation matters. Thereafter, the RCAF's involvement in civil operations was limited to aerial photography and search and rescue.³⁵ Freed of its former civil aviation responsibilities, the RCAF began to develop as a military air force. Squadrons once again became the fundamental organizational unit across the RCAF, as detachments previously employed on civil aviation operations were consolidated in 1936 to form two general purpose squadrons, one at Ottawa and one at Winnipeg. Efforts were also made to obtain up-to-date operational aircraft.

The roles of these newly formed squadrons were still loosely associated with the RCAF's former civil operations, but with the creation of the DOT to handle civil aviation, the RCAF was now authorized to create three squadrons for purely military tasks. These included an army cooperation squadron, a torpedo bomber squadron, and a bomber squadron, all to be located at RCAF Station Trenton, the RCAF's main training base. In 1937 one flight of the bomber squadron was split off to create a new fighter squadron, which was the last Permanent Force squadron to be formed prior to the Second World War.

The RCAF's reorganization as a military force was based, in part, on a major review of the nation's defence requirements that was conducted in 1932 by an interdepartmental government committee. The military staff of the committee put forward two distinct plausible contingencies: (1) the protection of Canadian neutrality, and (2) the need to despatch an expeditionary force to support operations overseas. For the RCAF, this translated into three planning scenarios, direct or home defence, the maintenance of neutrality, and, as a lower priority, the provision of squadrons for any expeditionary force which might be raised.

32 Kostenuk and Griffin, *RCAF Squadron Histories and Aircraft*, 11.

33 Douglas, *The Creation of a National Air Force*, 80.

34 For more details see: Douglas, *The Creation of a National Air Force*, 120-51.

35 Kostenuk and Griffin, *RCAF Squadron Histories and Aircraft*, 17.

The nature of the threat to Canada, which could be mounted with little warning, required forces in being and could be met only by the Permanent Force; however, the requirements of an expeditionary force, which would have to be mobilized, could be met by NPAAF squadrons. To prepare for the two contingencies, seven Permanent and twelve NPAAF squadrons were authorized.³⁶ Therefore, the Non-Permanent Active Air Force, which had been provided for in 1924 but never stood-up, finally came into being in 1932.

The first three NPAAF squadrons, all designated as army co-operation, were authorized to form at Toronto (No. 10), Vancouver (No. 11), and Winnipeg (No. 12). They began recruiting immediately, but were unable to accept aircraft and commence flying training until 1934 due to personnel and equipment shortfalls. Each squadron was allotted a Permanent Force detachment of two officers and five airmen to provide initial flying and groundcrew training, and to assist in maintaining the aircraft. A further two squadrons were approved in 1934, No. 15 (Fighter) and No. 18 (Bomber) at Montreal. These were followed in 1935 by No. 19 (Bomber) at Hamilton, No. 20 (Bomber) at Regina, No. 13 (Fighter) at Calgary and No. 21 (Fighter) at Quebec City. To allow for the future expansion of the Permanent Force, Non-Permanent units were re-numbered in the “100” block beginning in November 1937.

The last three NPAAF squadrons were established in April 1938, No. 114 (Bomber) at London; No. 116 (Coast Artillery Cooperation) at Halifax, and No. 117 (Fighter) at St John. In December 1938 the NPAAF was re-designated the Auxiliary Active Air Force and its establishment was increased by the addition of three wing headquarters: No. 100 at Vancouver, No. 101 at Toronto, and No. 102 at Montreal. When mobilized in September 1939, the Auxiliary represented one third of the total RCAF strength, and provided two of the first three squadrons deployed to England.³⁷

Having created an NPAAF/Auxiliary Air Force, the RCAF was left with the question of how to provide command and control for these squadrons. The first three squadrons, being army co-operation, required some means of formal liaison with the militia command structure. The RCAF came under the purview of the Militia, which already had a regional command and control structure across Canada; therefore, the solution to the command and control problem was the creation of Air Staff Officer (ASO), positions staffed by Permanent Force officers who were assigned to regional Army Military Districts which included the NPAAF squadrons. The role of the ASO was to advise the militia District Officer Commanding on RCAF matters and to supervise and assist in the organization and operations of the NPAAF army cooperation squadrons.³⁸

The use of ASOs within the local Military Districts did, however, create problems of command and control for the RCAF. In the fall of 1937, when the Senior Air Officer conducted an inspection of RCAF facilities and squadrons on the West Coast, he noted that No. 111 NPAAF Squadron reported to the Officer Commanding the local Military District, while No. 4 Permanent Force Squadron was responsible to Air Force Headquarters. This example illustrates the anomalies created by the existing command and control structure with two RCAF squadrons, located in the same city, performing the same role and yet administered and controlled by two different branches of the military. This inconsistency was corrected through the creation of a new RCAF command structure.³⁹

³⁶ Douglas, *The Creation of a National Air Force*, 124.

³⁷ Kostenuk and Griffin, *RCAF Squadron Histories and Aircraft*, 18.

³⁸ NDHQ, Air Staff, *History of the Air Reserve in Canada*, unpublished draft 2003, 9.

³⁹ Kostenuk and Griffin, *RCAF Squadron Histories and Aircraft*, 18; and Douglas, *The Creation of a National Air Force*, 137.

Revised RCAF Command Structure.⁴⁰ Due to the Air Force's small size, during the period 1924 to 1935 the RCAF's Senior Air Officer could exercise control of the country's air stations and detachments directly from Ottawa through the various headquarters directorates. By 1936, the growth and reorganization of the RCAF into a military force made it necessary to establish a formal military command and control structure, and authority was sought to create four air commands. Three of these were to be regional commands, each responsible for operational training, control of air defence forces, army co-operation, air transport and communications in their respective regions. The fourth would be a functional command responsible for training.

As envisioned in 1936, the new RCAF command structure would exercise these responsibilities:

- Eastern Air Command (Halifax) – operational control of all units in Nova Scotia, New Brunswick and Prince Edward Island;
- Central Air Command (Winnipeg) – operational control of all units in Manitoba, Saskatchewan and north-western Ontario;
- Western Air Command (Vancouver) – operational control of all units in Alberta and British Columbia;
- Air Training Command (Toronto) – control of all basic aircrew and groundcrew training and be responsible for training facilities at Trenton and Camp Borden; and
- RCAF Headquarters (Ottawa) – to administer all RCAF personnel and facilities and also to exercise operational control over all units in Ontario (excluding those in the north-western portion of the province) and Quebec.

By 1937, with the political situation in Europe continuing to deteriorate, the fear of war was reflected in the parliamentary votes for Canadian defence. From 1937 to 1939, the RCAF was allotted substantial budget increases rising to 30 million dollars by the beginning of the Second World War. With adequate funds finally available, the expansion, re-equipment, and development of the RCAF was accelerated and implementation of the proposed command structure began. In view of the limited threat to central Canada, the formation of Central Air Command, while authorized, was not carried out; instead its responsibilities were assigned to Western Air Command. The new commands were functioning by the outbreak of the Second World War and were able to oversee the resulting rapid expansion of the RCAF.

In December 1938 the RCAF, which had been subordinate to the Army (Militia) in some matters and which had reported to the Army Chief of the General Staff, gained co-equal service status with the Army and Navy. As directed in Air Force General Order No. 2 of November 1938, "The control and administration of the Royal Canadian Air Force will be exercised and carried out by the Senior Air Officer, who will in this respect report directly to the Minister of National Defence." General Order No. 3 created an Air Council to advise the Minister and the Senior Air Officer position was subsequently re-titled Chief of the Air Staff (CAS). Air Vice-Marshal (A/V/M) G.M. Croil became the first CAS in December 1938.⁴¹

On the eve of war, the RCAF had a total strength of 4,000 personnel (400 officers and 3,600 airmen), three-quarters in the Permanent component and the remainder in the Auxiliary. There were eight Permanent squadrons (of 11 authorized) consisting of two general purpose, two general reconnaissance, one fighter, one bomber, one torpedo-bomber, and one army co-operation. The Auxiliary Force consisted of 12 squadrons including four fighter, four

⁴⁰ For additional details see Douglas, *The Creation of a National Air Force*, 135-38.

⁴¹ For further discussion of this measure see Douglas, *The Creation of a National Air Force*, 137.

bomber, two army co-operation, and two coast artillery co-operation. None of the units were fully staffed or equipped, and only 15 (of 20) squadrons could be brought to full strength and mobilized, twelve for home defence and three for overseas service.⁴²

Deficiencies were also evident in the aircraft inventory. The RCAF had a total of 270 aircraft of 20 assorted types on strength, over half of which were training or transport types. Front line operational combat equipment was limited to 19 Hurricane fighters and ten Battle day-bombers. Other operational aircraft were obsolete types, including the Atlas, Wapiti, Shark and Siskin. With the outbreak of war, procuring new equipment would prove difficult until the domestic aircraft industry could be expanded. Under-staffed and equipped with obsolete aircraft, the RCAF of 1939 provided little indication of its full potential—to become the fourth largest air force among the allied powers.

RCAF Organization in the Second World War⁴³

The wartime RCAF organization contained three main components, only two of which were based in Canada. The first component, initially envisioned as the RCAF's primary contribution to the allied air effort, was a vast air training organization, the British Commonwealth Air Training Plan. The second component was a Canada-based home defence force, the Home War Establishment (HWE), which was ultimately to field 37 squadrons for coastal defence, shipping protection, air defence and other military duties. The third component was an overseas (expeditionary) force, the Overseas War Establishment (OWE), based in the UK, with administrative headquarters in London. From a modest force of three squadrons deployed overseas in early 1940, the OWE grew to include 48 squadrons operating under Royal Air Force control in the European, Mediterranean and Far Eastern theatres.⁴⁴

The British Commonwealth Air Training Plan (BCATP).⁴⁵ Even before hostilities began, it had been recognized that one of Canada's major contributions to the allied war effort could be as a training ground, where instruction of Commonwealth air personnel could be carried out away from the actual battle areas. Government representatives from the United Kingdom, Australia, New Zealand and Canada met in Ottawa to consider this concept, and in December 1939 signed an agreement to set up the BCATP. The importance of this massive undertaking to the war effort was recognized by US President Franklin D. Roosevelt, who called Canada the "aerodrome of democracy."⁴⁶

The initial BCATP plan provided for a cross-Canada network of Elementary Flying Training Schools, Service Flying Training Schools, and Air Observer Schools. Supplementing these were numerous other units for recruiting, training, maintenance, and administration, making a total of 74 schools, depots and other formations. When fully developed, the BCATP was expected to produce monthly: 520 pilots through elementary training, 544 pilots through service training, 340 air observers, and 580 wireless operators (air gunners). The first schools opened in April 1940, and all were in operation by 1942. The responsibility for establishing, administering and operating this complex plan was given to the RCAF, a force of little more than 4,000 officers and airmen.

42 Kostenuk and Griffin, *RCAF Squadron Histories and Aircraft*, 18.

43 For detailed discussion of the RCAF in overseas theatres in the Second World War see Brereton Greenhous, et al., *The Official History of the Royal Canadian Air Force, Vol. 3: The Crucible of War 1939-1945* (Toronto: Univ. of Toronto Press, 1994).

44 Kostenuk and Griffin, *RCAF Squadron Histories and Aircraft*, 18.

45 For more details on the BCATP see F.J. Hatch, *Aerodrome of Democracy* (Ottawa: Directorate of History, 1983); and Douglas, *The Creation of a National Air Force, Part II: The BCATP, 193-293*.

46 Kostenuk and Griffin, *RCAF Squadron Histories and Aircraft*, 18.

The BCATP was incrementally expanded, and reached its maximum complement of 97 schools and 184 ancillary units at the close of 1943. To exercise control over this extensive training organization, the RCAF created four new regionally based commands: No. 1 Training Command (Trenton), No. 2 Training Command (Winnipeg), No. 3 Training Command (Montreal), and No. 4 Training Command (Regina). At its peak, BCATP production in Canada averaged over 3,000 graduates per month, and in less than three years 82,000 aircrew were trained here.⁴⁷ The number of trained aircrew eventually exceeded requirements and it was possible to start a reduction in training early in 1944. The closing down of schools was accelerated in October, and at the end of March 1945 the BCATP officially was terminated.

Home War Establishment – The Home Defence RCAF.⁴⁸ When the war began in September 1939, the RCAF's Home War Establishment included two operational commands (Eastern Command and Western Command) controlling seven under strength squadrons equipped with a variety of obsolete aircraft and tasked to defend Canada's two coasts. Because the greatest threat to allied shipping was posed by German forces operating in the Atlantic, priority was initially given to building up Eastern Air Command and re-equipping its squadrons with modern aircraft. Once Japan entered the War in December 1941 and occupied islands in the Aleutian archipelago, thus threatening the west coast, priorities were reversed.

The HWE experienced its maximum growth from late 1941 through the spring of 1942. With Eastern Air Command moving squadrons into Newfoundland (not yet part of Canada) to extend its coverage of the North Atlantic and Western Air Command providing reinforcements to the United States forces in Alaska, problems were encountered in exercising operational control because squadrons were widely spread and communication facilities were limited and unreliable. To address these difficulties, both commands were authorized to create operational sub-headquarters designated "Groups," as required. Throughout the war each command had only one group under its command at any time, and control of squadrons was exercised from both the command and group levels. The HWE reached its peak force structure in November 1943 with a total of 37 squadrons: 19 in Eastern Air Command and 18 in Western Air Command.

The example of Eastern Air Command is instructive in a number of ways. As the performance of German U-boats improved, they were able to operate in Canadian waters and sink shipping as far west as the mouth of the St Lawrence River. The Canadian air response to these attacks was the responsibility of the RCAF's Eastern Air Command. Unfortunately, it did not perform well in the first part of this battle because it was slow to adopt RAF Coastal Command's battle-tested tactics and scarce resources were squandered through inefficient operations.⁴⁹ The Official History of the RCAF concludes that Canadian failures in anti-submarine warfare (ASW) were due to lack of adequate leadership. It argues that RCAF senior officers became preoccupied with the mundane, day-to-day tasks and problems of finding enough men and equipment to fly sorties. By focussing on details they did not take the time to learn or apply available improved techniques and doctrines and that their lack of competence wasted lives and materiel.⁵⁰ One of the key issues in the ASW campaign was the lack of co-ordination between air and naval forces. The Official History of the RCAF notes that it was not until February 1943 that RCAF

47 Ibid., 19.

48 For a detailed examination of the Home War Establishment see Douglas, *The Creation of a National Air Force*, 343-610.

49 Douglas, *The Creation of a National Air Force*, 465.

50 Ibid., 536.

higher commanders accepted the fundamental principle of British ASW practice—that maritime air forces should operate under appropriate naval direction.⁵¹

In addition to the shortcomings of senior Air Force officers in charge of the ASW effort, the official historians criticize those responsible for RCAF expansion in the Second World War because in many cases they reacted to events rather than engaged in long range planning. This tendency to react to events meant that they lacked responsiveness to the needs of the war effort. In particular they were criticized for their emphasis on increasing an already excessive fighter establishment, for which no threat existed, when RCAF ASW squadrons engaged in the critical Battle of the Atlantic were going short.⁵²

Overseas War Establishment – The Expeditionary RCAF.⁵³ As early as the fall of 1939, senior RCAF staff were pressing for the deployment of units to Britain, the CAS arguing that it was essential that the RCAF participate in overseas operations and not be restricted to home defence and the BCATP. He specifically proposed the formation of an overseas RCAF command, to operate under operational control of the RAF. It would consist of a bomber and fighter group, each comprised of three wings of two squadrons. This proposal was relayed to the RAF, who indicated that while an RCAF bomber group might be feasible, the geographical basis of RAF fighter groups and the frequent movement of squadrons between groups mitigated against forming an all-Canadian fighter group.

In part to address this RCAF proposal and similar suggestions by Commonwealth air forces, article 15 of the BCATP agreement of 17 December 1939, stated that: "... pupils of Canada, Australia and New Zealand shall, after training is completed, be identified with the respective dominions, either by the method of organizing Dominion units and formations, or in some other way." A supplementary agreement between Canada and the United Kingdom in January 1941 stipulated that in addition to the three already deployed, 25 RCAF squadrons (subsequently increased to 35) would be formed in the United Kingdom over the next 18 months.⁵⁴ Despite these agreements, 60 percent of Canadian aircrew served in RAF or other Commonwealth units, more than served in the 48 RCAF squadrons which eventually served overseas, and at times they were far from Canadian care and administration.⁵⁵

Due to the RCAF's heavy commitments to the BCATP and its primary responsibility for home defence, only three squadrons were initially available for overseas service. The first RCAF unit deployed overseas was an Auxiliary Air Force army co-operation squadron, which had to be augmented by personnel from two other squadrons. It arrived in Britain in February 1940, and began training with the intention of accompanying the Canadian Army to France. Four months later a second Auxiliary Air Force army co-operation squadron and a Permanent Air Force fighter squadron, both augmented by additional personnel, were also deployed overseas. The fall of France and the cessation of British land operations in Western Europe relegated the two army co-operation squadrons to a long period of inaction, but the fighter squadron saw action in the Battle of Britain in the summer of 1940.

In view of the large number of Dominion squadrons which were being formed in the UK to operate under RAF control and to avoid confusion with low-numbered RAF squadrons, the

51 Douglas, *The Creation of a National Air Force*, 547.

52 Ibid., 610

53 For a detailed history of RCAF operations overseas during the Second World War see Greenhouse, et.al., *The Crucible of War*.

54 Kostenuk and Griffin, *RCAF Squadron Histories and Aircraft*, 75.

55 English, *The Cream of the Crop*, 141.

British Air Ministry implemented a “block” numbering system. The 400-445 “block” was assigned to the RCAF, and as a result, RCAF squadrons already deployed overseas were re-numbered in this block. By the end of the war the number of squadrons in the overseas 400 series had grown to 44, supplemented by a deployed Eastern Air Command coastal patrol squadron and three air observation post (AOP) squadrons with Royal Canadian Artillery aircrew and RCAF ground support personnel.

The 48 RCAF squadrons that served overseas included units employed in all the main air power functions. These included 15 bomber, 11 day-fighter, 3 fighter-bomber, 3 fighter-reconnaissance, 3 night-fighter, 1 intruder, 6 coastal patrol, 3 transport, and 3 AOP squadrons. These overseas units of the RCAF were administratively controlled from RCAF (Overseas) Headquarters in London, but were assigned under the operational control of the appropriate RAF Command. The RAF Command structure was organized primarily on a functional basis, reflecting the functions represented in their assigned flying squadrons, although some regional commands, like RAF Middle East Command, were created when it was necessary to exercise command and control of some widely dispersed units that were operating together in a remote theatre of war. The assignment of RCAF squadrons to RAF commands and to their subordinate formations, could be, and frequently was, changed as operational requirements dictated.

RCAF Units in RAF Commands in the Second World War

Army Cooperation Command. When Canadian Army requirements for the European theatre were being drawn up, one of the formations assigned to it was to have been an army cooperation wing comprised of three squadrons equipped with Lysander aircraft. Due to personnel shortfalls, it was necessary to disband one squadron and redistribute its personnel to the other two squadrons and to dispense with the proposed wing headquarters. As a result, only two RCAF squadrons were sent to serve with Army Cooperation Command.

The rapid fall of France in 1940 precluded the operational employment of the Canadian army cooperation squadrons, and in view of the pressing need for air defence units, one army cooperation squadron was re-roled as a fighter squadron on Hurricane aircraft and transferred to RAF Fighter Command. The second squadron was re-equipped with Tomahawk aircraft and was joined by a second RCAF squadron equipped with Tomahawks to create No. 39 (Army Cooperation) Wing. A third RCAF squadron was added to the Wing in 1943, but shortly afterwards Army Cooperation Command was disbanded, and the RCAF Wing and its three squadrons were transferred to the newly created Second Tactical Air Force.⁵⁶

Some have noted that in the army cooperation role the RCAF laboured under pre-war RAF doctrine which frowned on close support of army units and saw the air force role in support of ground forces as primarily interdiction well behind enemy lines. It has been suggested that Canadian airmen were more amenable to the army co-operation role because of their experience as “bush pilots in uniform” in the inter-war years or perhaps because the RCAF had only become an independent service in 1938. Others claim this flexibility was the result of the influence of Canada’s dominant military mind between the wars, the soldier-scientist A.G.L. McNaughton, a dedicated advocate of air power in the land battle and, as we have seen, was someone who had extensive experience in air-ground operations in the First World War. As commander of Canadian troops in Britain for the first four years of the war (until December 1943), McNaughton originally thought in terms of a three-squadron

⁵⁶ Kostenuk and Griffin, *RCAF Squadron Histories and Aircraft*, 78.

army co-operation wing for the Canadian Army overseas. His plan was for this wing to support one or two divisions which was three times the number of squadrons called for in British doctrine. And when the 1st Canadian Army was created on Easter Monday 1942, McNaughton advocated an RCAF army co-operation wing of six squadrons to support it.⁵⁷

Second Tactical Air Force. RAF doctrine before the war had focussed on strategic bombing and little attention had been given to tactical air operations in support of the army. The success of the Luftwaffe in supporting ground operations during the German blitzkrieg, however, led to a reappraisal by the RAF of its doctrine regarding support to land forces. The RAF's first effective ground support operations were those conducted by the Desert Air Force in North Africa in reconnaissance, day-fighter and fighter-bomber operations in support of the Eighth Army. One RCAF day fighter squadron served with the Desert Air Force in operations from the Nile valley to the plains of Northern Italy. For the invasion of Europe, it was planned to form a similar tactical air force to support British and Canadian invasion troops. Second Tactical Air Force was created with squadrons transferred primarily from Fighter Command, and it comprised a bomber group with light and medium bombers; two composite groups with day-fighter, fighter-bomber and reconnaissance units; and a base group, with day and night fighters for the defence of its airfields.

According to a number of historians, Anglo-Canadian ground forces in Normandy were not up to the task of breaking through the well-prepared German defences in northwest France. They cite inadequate co-operation between infantry and armour as a major weakness, compounded by an excessive reliance on ponderous, set-piece frontal assaults that wore defenders down through attrition but that cost the attackers dearly.⁵⁸ Therefore, Anglo-Canadian ground forces relied on air forces to provide much of the firepower required to crack the German defences. Experience gained in North Africa and experiments and exercises conducted by Army Co-operation Command showed the need for close liaison between ground and air forces, and, in theory, army and air staffs met regularly to arrange the details of support to land forces. However, doctrine and theory did not always work well in operations. A report prepared by 1st Canadian Army indicated that there were considerable difficulties between Army Headquarters and RAF Tactical Group Headquarters over the manner in which air resources were to be employed especially with respect to the engagement of targets selected by the Army. The Army usually wanted close air support (i.e., the engagement of targets near the front lines where they were an immediate threat but were often more difficult to locate and attack from the air), whereas the Air Force preferred interdiction (i.e., attacking forces well behind the front lines where they were often more vulnerable to air attack). The report went on to say that the results achieved in co-ordinating air support to land forces varied according to personalities of members of higher level staffs involved. When personalities clashed the Army report claimed that the RAF attitude tended to be one in which an Army requirement was regarded with suspicion and something to be treated as an opportunity for destructive criticism rather than a matter of joint interest and importance. The report indicated that the origin of these difficulties lay in the RAF officers' anxiety to preserve autonomy of their service. Major-General C.C. Mann (formerly the chief staff officer of the 1st Canadian Army) in a lecture to an Army Staff course in 1946 asserted that the reason for this command and control failure was that everyone had ignored the human factors of the situation.⁵⁹ We shall see that there are parallels to this situation today.

⁵⁷ Greenhous, et.al., *The Crucible of War*, 172-3.

⁵⁸ Ibid., 311.

⁵⁹ Ibid., 324-5.

Part of the problem the Canadian Army had with its air support requirements might be attributed to the fact that 1st Canadian Army was working with British air forces not the RCAF. McNaughton had originally arranged for Second Tactical Air Force's 83 Group to be "Canadianized," by having Canadian squadrons assigned to it, and then arranging for 83 Group to support 1st Canadian Army.⁶⁰ However, McNaughton's concept of a joint Canadian Army-Air Force team foundered when 2nd British Army was chosen for the D-Day assault role in place of 1st Canadian Army. The RCAF decided to keep 83 Group with the assaulting forces and therefore to support 2nd British Army so as not to "relinquish its honoured position" in the assault, as the Official History puts it.⁶¹ And so the RCAF continued the long Canadian tradition of fighting as separate services and not as a joint force.

However this situation changed by Operation VERITABLE (February 1945) when composite air groups were no longer tied to a particular Army and instead were given a specific role to play in support of the Army Group as a whole. For example, 9,000 sorties were flown on 14 February 1945, and that day RCAF squadrons flew almost 1,500 sorties in support of the 1st Canadian Army, the first time there was close co-operation between Canada's air and ground forces, according to the Official History.⁶²

Nevertheless, 83 (Composite) Group is an example of a Canadian expeditionary air force on a scale not seen in over 50 years. In June 1944 the Group consisted of 29 squadrons (15 of which were RCAF) organized into 9 wings. The Group was completely self sufficient with own communications, servicing, supply, and transport units, including two RCAF Mobile Field Hospitals.⁶³ Given that this Group operated as part of a joint and combined force with foreign forces under its command, there are no doubt lessons for today to be learned from its experience; however, little has been written about this Group outside short descriptions in the Official History of the RCAF.

Fighter Command.⁶⁴ A total of twelve RCAF squadrons served with Fighter Command, eight in the day fighter, three in the night fighter and one in the intruder roles. The first RCAF fighter squadron arrived in Fighter Command in the critical period of June 1940, just before the Battle of Britain. During the Battle of Britain, Fighter Command was involved only in defensive counter-air operations. However, when the German bomber offensive changed from daylight to night attacks in October 1940, Fighter Command lost little time in changing its day fighter force to the offensive counter-air role by organizing them into two-squadron wings, led by experienced RAF wing commanders. These "Wing Commanders Flying" were responsible to the air defence sector commander for air operations, but carried no administrative responsibility for the wing or its parent station.

The RCAF squadrons operated as part of RAF wings until the spring of 1941, when battle-proven RCAF leaders became available and all-Canadian wings were created. The first Canadian wing was the Digby Wing composed of two squadrons operating Hurricane aircraft, and the second was the Henley Wing composed of four RCAF squadrons operating Spitfire aircraft. The two RCAF wings were disbanded when their squadrons were transferred to the Second Tactical Air Force in 1943.

60 Ibid., 271.

61 Ibid., 272.

62 Ibid., 344.

63 Ibid., 272.

64 A detailed description of the participation of RCAF fighter forces in the OWE can be found in Greenhouse, et al., *The Crucible of War*, 163-353.

The RCAF also contributed three squadrons to Fighter Command night fighter operations.⁶⁵ These squadrons became operational late in the summer of 1941 on Beaufighter aircraft equipped with intercept radar, and after the invasion of Europe, in June 1944, the squadrons provided cover over the airfields of the Second Allied Tactical Air Force. The RCAF also provided one intruder⁶⁶ squadron, equipped with Mosquito aircraft, to patrol over enemy airfields to attack returning bombers or to harass the airfield with bombing and strafing attacks.⁶⁷

Bomber Command.⁶⁸ In discussions between Canadian and British officials during the summer of 1941, it was agreed in principle to form a Canadian bomber group as soon as enough RCAF bomber squadrons were available. Accordingly, in August 1942, RCAF bomber squadrons began to redeploy to RAF stations in Yorkshire, in preparation for coming under the command of the still unformed Canadian No. 6 Group. This would be the most northerly situated group in Bomber Command, with headquarters located at Allerton Hall, Allerton Park in Yorkshire. By the end of the war, the Group would expand to include 14 squadrons operating from eight stations.

Throughout the war, command of the bomber offensive was highly centralized and closely controlled by Bomber Command Headquarters. A group headquarters, in addition to its administrative function and concern with forming additional squadrons, was responsible for ensuring that its squadrons were operationally ready and properly dispatched. The stations provided the squadrons with housing and messing facilities, and appropriate airfield facilities. Initially, the bomber squadrons were responsible for their own administration and aircraft maintenance.

To deal with pressing support and maintenance issues due to its rapid expansion, in 1943 Bomber Command introduced a new bomber operational base system. The base organization consisted of a parent station, usually a permanent pre-war facility, from which the base took its geographical name, and either one or two satellite stations, usually temporary wartime facilities, each station housing one or two bomber squadrons. Station headquarters assumed full administrative responsibility for the squadrons located there, and organized central maintenance sections to maintain aircraft. Squadron establishments were reduced to only aircrew, with a small staff complement to handle mission planning activities and routine aircraft servicing.⁶⁹

While they usually operated from one station, bomber squadrons were occasionally deployed. In May 1943 three RCAF bomber squadrons equipped with Wellington aircraft were temporarily detached from No. 6 Group, and transferred to North Africa. There, operating as No. 331 Wing, they took part in a heavy bombardment operation in support of allied landings in Sicily and Italy. In October the Wing returned to England, where the Wing Headquarters was disbanded and the squadrons reassigned within No. 6 Group. With this Group, the RCAF had the highest level of command (at the two star level) and command organization of any of its overseas forces.⁷⁰

⁶⁵ Night fighter operations were defensive counter-air operations, undertaken under cover of darkness.

⁶⁶ Intruder operations were conducted by day or night over enemy territory with the primary object of destroying enemy aircraft in the vicinity of their bases.

⁶⁷ Kostenuk and Griffin, *RCAF Squadron Histories and Aircraft*, 76.

⁶⁸ A detailed description of the participation of RCAF personnel in RAF Bomber Command can be found in Greenhouse, et al., *The Crucible of War*, 523-867.

⁶⁹ Kostenuk and Griffin, *RCAF Squadron Histories and Aircraft*, 77.

⁷⁰ Ibid., 76.

Coastal Command.⁷¹ Coastal Command's major task was to conduct operations against the enemy's submarines and surface ships, including merchant vessels, in cooperation with the Royal Navy. To this end, Canada contributed large numbers of air and ground personnel to RAF squadrons, and at different times up to seven coastal patrol squadrons. Three squadrons were equipped with landplanes, and four were equipped with flying boats.⁷² There was no Canadian command organization above squadron level in Coastal Command.

South East Asia Command.⁷³ Three RCAF squadrons served with the RAF's South East Asia Command, two transport and one coastal reconnaissance. The two transport squadrons were formed in India in 1944, and flew Dakota aircraft in support of the British Fourteenth Army operating in India and Burma. When the war in the Pacific ended, they were transferred to the United Kingdom, where they joined a third RCAF squadron in forming No. 120 Wing supporting Canadian occupation forces in Germany. The Coastal Reconnaissance squadron formed in Britain in late 1941 to operate Catalina flying boats for Coastal Command, and was transferred to Ceylon in 1942 when the Japanese offensive began.⁷⁴ Other than 120 Wing, after the war, there was no Canadian command organization above squadron level in the RCAF units assigned to South East Asia Command.

Transport Command. In addition to its major representation in Fighter, Bomber, and Coastal Commands, the RCAF contributed a small number of units to RAF Transport Command. The RCAF did not form its transport squadrons until the late summer of 1944 when three transport squadrons were formed overseas: two squadrons to operate in South-East Asia and one to operate in North-West Europe. Following the defeat of Germany, the three squadrons were assigned to a new RCAF No. 120 Wing Transport Wing (see above), which was disbanded in June 1946.

British Air Forces of Occupation (Germany).⁷⁵ Following the defeat of Germany, the RCAF continued to maintain some forces on the continent as part of the British Air Forces of Occupation. The RCAF contribution included a wing comprised of four squadrons equipped with Spitfires and an Air Observation Post equipped with Austers. Four RCAF bomber squadrons were retained in the UK as part of Bomber Command's strike force, while another squadron was re-equipped with Liberator transport aircraft and transferred to Transport Command to be employed on troop runs between the UK and India.

"Tiger Force" Pacific.⁷⁶ The allied strategy in the Second World War had been to first defeat Germany, and then to focus allied efforts on the Pacific to defeat Japan. By the summer of 1944, victory in Europe seemed assured, and planning began for a Commonwealth contribution to the Pacific theatre. To this end, a large long-range bomber force, named "Tiger Force," was proposed. It was to comprise three bomber groups, one RAF, one RCAF and one composite including British, Australian, New Zealand and South African squadrons. Each group was to comprise 22 squadrons: 12 bomber, 6 fighter, 3 transport and 1 air-sea rescue.

71 A detailed description of the participation of RCAF maritime air forces in the OWE be found in Greenhouse, et al., *The Crucible of War*, 375-474.

72 Kostenuk and Griffin, *RCAF Squadron Histories and Aircraft*, 77.

73 A detailed description of the participation of RCAF transport forces in the OWE be found in Greenhouse, et al., *The Crucible of War*, 877-909.

74 Kostenuk and Griffin, *RCAF Squadron Histories and Aircraft*, 77.

75 A detailed description of the participation of RCAF transport forces in the OWE can be found in Greenhouse, et al., *The Crucible of War*, 877-909.

76 A description of RCAF Tiger Force can be found in Greenhouse, et al., *The Crucible of War*, 106-24, 863.

In March 1945, the plan had been scaled back to include two groups, an RAF group based on No. 5 Group and an RCAF group based on No. 6 Group. The group's composition was further reduced to eight bomber and three transport squadrons, with fighter escorts to be provided by Commonwealth forces already in the Pacific theatre. When Germany surrendered on 5 May 1945, the eight RCAF squadrons were converted to Canadian-built Lancaster bombers, and returned to Canada for operational training. However, before the squadrons could be deployed Japan surrendered on 6 August 1945 and they were disbanded in September.⁷⁷

The RCAF Second World War Experience

During the Second World War, the RCAF expanded to almost 200 times its peacetime strength: from 1,150 all ranks in 1938 to a wartime peak of 206,350 at the end of 1943, of which 46,272 served overseas. Whereas it had been possible for the pre-war RCAF to exercise control of its personnel and units from various headquarters and directorates in Ottawa, the increased wartime establishment required commensurate expansion of the command structure. The RCAF's expanded wartime organization comprised three main entities: the BCATP, the Home War Establishment, and the Overseas War Establishment.

RCAF control of the BCATP, encompassing some 97 schools and 187 ancillary units, plus 27 RAF schools located in Canada, was conducted by four regional commands: No. 1 Training Command (Trenton), No. 2 Training Command (Winnipeg), No. 3 Training Command (Montreal) and, No. 4 Training Command (Regina). These commands were created in early 1940 to replace the existing Air Training Command. They were commanded by officers of Air Vice-Marshal (two star) rank, and were disbanded or merged with other formations when the BCATP was wound down beginning in 1944.

To control its operational forces across Canada, the RCAF created two regional commands: Eastern Air Command and Western Air Command. Eastern Air Command was ultimately to control 19 squadrons and Western Air Command 18 squadrons, operating from some 40 stations located primarily along Canada's two coasts. Squadrons and detachments rotated frequently among the stations as operational conditions changed. Each HWE command was headed by an Air Vice-Marshal, who exercised full command (operational and administrative) over assigned forces. The commands were authorized to create subordinate groups to enhance operational control; however, each created only one subordinate group to control some squadrons, and the commands continued to exercise direct operational control of the squadrons not assigned to a group. The senior leadership of Eastern Air Command has been criticized by the Official History of the RCAF for being preoccupied with the detailed tasks of running their organizations, and, thereby not paying sufficient attention to the larger issues of improving command and control arrangements and evaluating new ASW doctrine and techniques.

When the RCAF deployed forces out of Canada as part of the Overseas War Establishment, command and control arrangements were considerably different than for units based in Canada. An RCAF Overseas Headquarters was established in London on 1 January 1940 and from 1941 was commanded by an Air Marshal (three star). It was established to exercise administrative control over all RCAF personnel and units deployed overseas. However, operational command of RCAF units and formations was transferred to the RAF and exercised by the RAF Command to which the units or formations were assigned. The RAF Command structure was primarily functional, paralleling the functions represented in the

⁷⁷ Kostenuk and Griffin, *RCAF Squadron Histories and Aircraft*, 78.

flying squadrons. The RAF assigned and re-assigned RCAF squadrons to RAF commands and to RAF subordinate formations as operational requirements dictated.

Although the RCAF provided a significant contribution to allied air power in the Second World War, there were no high-level operational command positions in the RCAF Overseas War Establishment.⁷⁸ The Canadian practice of relinquishing operational command of its overseas air forces to the RAF, therefore, had an impact on the command capabilities of the RCAF during and after the war. The most senior RCAF operational command was the Air Officer Commanding (AOC) No. 6 (RCAF) Group, headed by an A/V/M (two star), who reported directly to RAF Bomber Command. However, the AOC No. 6 Group played a very minor role in the planning and execution of the bomber campaign, and it could be argued that he was really only a high level tactical commander. The absence of an operational-level RCAF command structure limited opportunities for senior RCAF officers to become exposed to strategic- and operational-level planning considerations. It also meant that the RCAF had little say in the employment of RCAF units overseas. Furthermore, Canadian politicians were often frustrated because, with Canada's Air Force units dispersed throughout the RAF, it was difficult for the achievements of those units to become known so that they could bolster public support for the war and gain recognition from Canada's allies for her contribution to the war effort. C.P. Stacey, Canada's pre-eminent military historian, argued that wartime policies "'broke the back' of the RCAF" and prevented it from fielding a "national air force" with the same higher command opportunities as those enjoyed by the Canadian Army.⁷⁹

In effect, the RCAF Overseas War Establishment was primarily a force generation organization, providing operationally ready squadrons and formations for force employment by the RAF operational commands. In the absence of an overseas RCAF operational-level command, there was no imperative for the RCAF to develop a balanced force structure for the Overseas War Establishment. Instead, the RAF was responsible for contributing to a balanced "Allied/Dominion Air Force," comprised of units provided by all the dominion/allied air forces. This was in part reflected by the RAF assignment of specific numbers (e.g., the "400" block for the RCAF) to allied squadrons which were under their operational control. This force generation role was accepted by the majority of the Commonwealth and other allied air forces, with the main exception being the US Army Air Forces (the predecessor of the US Air Force), which operated under its own command structure.

While all squadrons of the OWE were technically part of an expeditionary force "deployed" from Canada (overseas deployment was hence the norm), further deployment of units within the overseas theatres varied considerably. Liability for deployment depended greatly on the function of the units, range of aircraft flown by units, the commands to which they were assigned, and the operational situation. Fighter Command and Army Cooperation Command / 2 TAF were very much deployable organizations, in part because the short range of their fighter aircraft required that they move in concert with the ground forces they were supporting. Fighter squadrons were thus liable to be rotated between stations and/or formations, and to accommodate this rotation were generally self-contained. RAF Bomber Command was a much more static organization, and as the war progressed, adopted a base posture with central logistics support, a posture unsuited for deployed operations. However, at the termination of hostilities in Europe, it

⁷⁸ For a complete list of senior RCAF appointments in the Second World War see Greenhous, et al., *The Crucible of War*, 913-18.

⁷⁹ C.P. Stacey, *A Date with History*. Ottawa: Deneau, [1982?], 257.

was planned to deploy a major part of the Bomber Command force (the “Tiger Force”) to the Far East. Eight RCAF bomber squadrons returned to Canada for training and reorganization, but were disbanded shortly after the Japanese surrender.

The Post-War Years – 1945–1968

Overview. With the formal cessation of hostilities in September 1945, a two year “interim period” was announced by the government for Canada’s armed services, during which the emphasis was to be on demobilization. By July 1946, all of the RCAF squadrons overseas had returned to Canada, and, along with most of the home-based units, had been disbanded. In February 1946, the Cabinet approved a new peacetime structure for the RCAF, which was to be comprised of four components: a Regular Force, an Auxiliary, a Reserve, and the cadet organization. The Regular Force consisted of units manned by personnel engaged for full-time military service; the Auxiliary consisted of units with personnel engaged for part-time military service, while the Reserve was a pool of inactive personnel available for activation in the event of mobilization (not unlike the “air militia” after the First World War).

The RCAF Regular Force had an authorized establishment of 16,100 all ranks, with an operational force of eight squadrons and was to constitute a highly trained nucleus for immediate wartime employment. With an existing force of five squadrons, the Regular Force resumed its pre-war activities of aerial photography, air transport and communications. The RCAF Auxiliary was authorized an establishment of 4,500 all ranks, with a force structure of 15 squadrons and was to provide a ready reserve of units that could be mobilized with a minimum of delay. Assigned the primary role of air defence, the Auxiliary began to form flying squadrons and ground control units in 1946 and continued in this role until 1954, when Regular Force CF100 all-weather interceptor squadrons were created and took over this role.⁸⁰

To exercise control over the new force structure, the RCAF initially created two regionally based air commands, each with subordinate groups. These were Central Air Command with headquarters in Trenton and No. 10 Group at Halifax, and North West Air Command with headquarters at Edmonton and No. 11 Group at Winnipeg and No. 12 Group at Vancouver. In addition, No. 9 (Transport) Group and Maintenance Command were established in Ottawa as functional, rather than regional, organizations. Commencing in 1948, the RCAF revised its organizational structure along purely functional lines, including both commands and groups. The new structure included: Air Transport Command, No. 1 Air Defence Group, Air Materiel Command, Training Command, Maritime Group, and Tactical Air Command. Increased international tension in the early 1950s and Canada’s participation in NATO resulted in the creation of a new overseas command, No. 1 Air Division,⁸¹ and the elevation of Air Defence and Maritime Groups to command status. With minor changes, this organizational structure served the RCAF well for the next twenty years.

During the 1950s the RCAF grew steadily as relations between the West and the Soviet bloc deteriorated. In January 1955 the authorized strength of the Regular RCAF was increased to 51,000, for the first time exceeding that of the Army at 49,000. The Auxiliary experienced a more modest expansion to nearly 5,900 in mid-1952. The RCAF operational force structure expanded commensurately from five Regular Force squadrons in 1947, to a peak of 29 Regular and 12 Auxiliary flying squadrons in 1955. However, beginning in

⁸⁰ Kostenuk and Griffin, *RCAF Squadron Histories and Aircraft*, 144.

⁸¹ Air Divisions were not part of the usual RAF/RCAF organizational structure. No. 1 Air Division was a command of the RCAF headed by an Air Vice-Marshal (2 star), based in Europe, and under NATO operational control.

1962, the RCAF entered a protracted period of downsizing, and when integrated into the Canadian Forces in 1968 comprised 18 Regular and 4 Auxiliary squadrons. At the time of integration, these squadrons were tasked with conducting operations in four primary roles and were assigned to three corresponding functional commands, Air Transport, Maritime Air, and Air Defence, plus No. 1 Air Division in Europe.⁸² It could be argued that No. 1 Air Division was a geographically-based command; however, it also could be argued that it was a functionally-based command as the vast majority of its aircraft carried out only one role (at first air defence and later nuclear strike).

Air Transport. Air transport was one of the primary roles assigned to the Canadian Air Force of 1920; however, when war was declared in 1939, defence of Canada and preparation to deploy forces to the UK took precedence. By the summer of 1943, demands on the RCAF for air transport had increased to the extent that a discrete organization was considered necessary to coordinate all air transport resources. As a result, in August 1943, the Directorate of Air Transport Command was created within RCAF Headquarters, to exercise control of a transport wing of two squadrons, a ferry wing of two squadrons, and a communications squadron.

Post-war problems with control and administration of air transport assets resulted in the reorganization of the Directorate in 1945 as a separate Transport Group (No. 9), with headquarters at Rockcliffe. Although its primary role was air transport, No. 9 (Transport) Group was also assigned the secondary role of completing the aerial photography of Canada, which was achieved in 1950. As the volume and importance of air transport activities continued to grow in the post-war period, emphasis was placed on introducing long range transport aircraft to support the country's commitments to NATO and NORAD. No. 9 (Transport) Group was elevated to command status as Air Transport Command in April 1948, moving to Lachine, Quebec in 1951 and then to Trenton in 1959.

When Air Transport Command was absorbed into the Canadian Forces in 1968, its organization and establishment were unaffected. At that time it comprised four operational Regular Force squadrons operating Yukon and Hercules transport aircraft. Four Auxiliary wings comprising six squadrons operating Otter aircraft were also assigned to Air Transport Command.⁸³

Maritime Air. Under the initial plans for the post-war RCAF, there was no clearly stated intention to use Air Force units in defence of Canada's coasts. Coastal defence was mainly the responsibility of the Royal Canadian Navy, employing its anti-submarine destroyers and one aircraft carrier. Despite the creation of an effective and sophisticated joint RCAF-RCN maritime command and control arrangement during the Second World War,⁸⁴ after the war the RCAF maintained only a small headquarters in Halifax for coordination with the RCN, No. 10 Group of Central Air Command. The growing strength of the Soviet submarine fleet during the Cold War and its potential threat to sea lanes in the North Atlantic as well as submarine-based nuclear attack on North America, resulted in the government decision to field a considerable RCAF maritime force to augment the RCN.

No. 10 Group was accordingly re-designated Maritime Group in 1949 and assigned two maritime reconnaissance squadrons equipped with Lancaster aircraft. In April 1952, the Group was assigned to the newly formed Allied Command Atlantic of NATO and extended

⁸² Kostenuk and Griffin, *RCAF Squadron Histories and Aircraft*, 144.

⁸³ Ibid., 144-5.

⁸⁴ A detailed description of the evolution of this command and control arrangement can be found in Richard Goette, "The Struggle for a Joint Command and Control System in the Northwest Atlantic Theatre of Operations," unpublished MA thesis, Queen's University, 2002.

its responsibilities to the Pacific coast with the formation of a squadron at Comox. In 1955, Neptune aircraft replaced the Lancasters and were in turn replaced by the Canadair Argus in 1958. The Group was elevated to command status as Maritime Air Command in June 1953 and it reached its maximum establishment of four squadrons with the formation of a new squadron at Summerside, P.E.I. in May 1961. The RCAF's Maritime Air Command was disbanded in January 1966 and all of its units were transferred to the integrated Canadian Forces Maritime Command.⁸⁵

Air Defence. Under initial RCAF post-war plans, responsibility for the air defence of Canada's major cities was assigned to Auxiliary flying squadrons and mobile radar squadrons. Accordingly, eight of ten Auxiliary squadrons formed in 1946-48 were designated as day-fighter and were equipped with either Vampire or Mustang fighter aircraft. No Regular air defence squadrons were created and there was no national command and control organization for air defence. In the United States, however, a permanent air defence radar line was envisaged, backed by a force of active component fighters. The deteriorating international situation after the Second World War and the build up of the Soviet long-range bomber force changed Canadian thinking and resulted in the RCAF forming No. 1 Air Defence Group at Air Force Headquarters in Ottawa in December 1948, and moved to St-Hubert, Quebec a year later.

In February 1951, Canada and the United States signed an agreement to co-operate in the air defence of North America through the development of a closely integrated radar system. Canada had already decided to improve its air defence forces through expansion of Air Defence Group (which was elevated to command status in June 1951) and the development of a Canadian all-weather interceptor, the Avro CF100 Canuck. Air Defence Command peaked at 19 squadrons in mid-1955: 9 Regular Force squadrons with CF100s and 10 Auxiliary squadrons with Vampires and Mustangs.

Canada and the United States signed an agreement in August 1957 to integrate their national air defence systems into a single operational command, the North American Air Defence Command (NORAD). The NORAD agreement was for an initial ten-year period and created a bi-national command structure with a US Commander-in-Chief and a Canadian Deputy. Bomarc surface-to-air missiles were acquired in 1958, additional fixed radar units were fielded and computers introduced in the new Semi-Automatic Ground Environment (SAGE), which would be housed underground in the NORAD Canadian Regional command centre at North Bay.

These changes had far-reaching effects on the Air Defence Command organization. The role of the Auxiliary was changed from air defence to a national survival role in case of nuclear attack. Accordingly, its radar squadrons were disbanded and its flying squadrons were re-assigned to light transport and emergency support duties and were transferred to Air Transport Command. As the Soviet manned bomber threat was replaced by a missile threat, the planned transition from CF100 Canuck to the CF105 Avro Arrow was cancelled and instead a smaller fleet of used CF101B Voodoo fighters was obtained from the USAF in 1961 to meet the diminished air-breathing bomber threat. Only five Regular Force squadrons were re-equipped with the CF101, and as a result of attrition, this number was further reduced to three in 1964. Air Defence Command Headquarters moved to North Bay in August 1966, where it eventually became one of the new functional commands in the integrated Canadian Armed Forces establishment.⁸⁶

⁸⁵ Kostenuk and Griffin, *RCAF Squadron Histories and Aircraft*, 145

⁸⁶ *Ibid.*, 145-6.

No. 1 Air Division (Europe). The North Atlantic Treaty Organization came into effect in August 1949, binding all signatory nations (including Canada) to take action to maintain security in the North Atlantic region, declaring that an attack against one would be considered an attack against all. As relations with the Communist bloc deteriorated, the United States proposed the creation of an integrated military force in Western Europe under a single supreme commander, and in April 1951, Supreme Headquarters Allied Powers Europe (SHAPE) was created. Canada agreed to provide maritime, land and air forces to the new NATO command structure.

Canada's air contribution to NATO's Fourth Allied Tactical Air Force (4 ATAF) in central Europe was to take the form of a new, European-based RCAF command - No. 1 Air Division. This command was to consist of four day-fighter wings, each of three squadrons equipped with 24 Sabre aircraft. The squadrons would be based at four new airfields, two in France (Grostenquin and Marville) and two in Germany (Zweibrucken and Baden). Until these new bases could be completed, one fighter wing was temporarily based in England. 1 Air Division Headquarters was officially established at Paris in October 1952 as an operational formation of Allied Command Europe and moved to Metz, France in April 1953.

In response to a NATO request for additional all-weather fighter resources in 1956, the RCAF began to replace one day-fighter squadron in each wing with a CF100 all-weather squadron from Canada. In 1962, as a result of a change in NATO strategy, the government announced that it would re-role and re-equip the Air Division for the nuclear strike role. The eight Sabre squadrons were re-equipped with CF104 Starfighters, while the CF100 squadrons were disbanded. Disagreement between France and NATO arose over control of nuclear weapons on French soil, and concluded with a decision that NATO-controlled nuclear forces could not be stationed in France. As a result, the RCAF closed No. 2 Wing at Grostenquin, redeploying its two strike squadrons to the Germany-based wings, and re-rolled the No.1 Wing Marville squadrons to the reconnaissance role.

In 1966 the French government announced that it was withdrawing its forces from NATO, and requested that all NATO forces be withdrawn from its territory. Canada arranged to take over the French airbase at Lahr, Germany in exchange for the Canadian base at Marville, and redeployed No. 1 Wing and 1 Air Division Headquarters to its bases in Germany in April 1967. As a result of an earlier decision not to procure additional CF104s to replace aircraft lost through attrition, the Air Division was reduced from eight to six squadrons in 1967. A further reduction occurred in 1968 when the Zweibrucken Wing was disbanded and its two squadrons were redeployed to the remaining two wings. No. 1 Air Division, comprising two wings and six squadrons was integrated into the Canadian Forces in February 1968.⁸⁷

Support Commands. In addition to the four operational commands, the post-war RCAF structure included two commands responsible for providing support services to all RCAF organizations: Air Materiel Command and Training Command.

Air Materiel Command was formed as RCAF Maintenance Command at Uplands (Ottawa) in October 1945. In April 1949 it was re-designated Air Materiel Command (AMC) and moved to new accommodations at Rockliffe (Ottawa). The broad function of AMC was to carry out the logistical policies and plans of Air Force Headquarters and to provide logistics support for all RCAF activities and organizations. The RCAF logistics system was the most advanced among the three services and became the model for the Canadian

⁸⁷ Ibid., 146-7.

Forces during integration and unification. Air Materiel Command was disbanded as an RCAF command on 1 August 1965 on the formation of the new integrated Canadian Forces Materiel Command Headquarters at Rockliffe.⁸⁸

RCAF Training Command was the post-war successor to the BCATP. It was responsible for training all RCAF aircrew to “wings” (basic aircrew) standard, and for conducting basic and advanced trades courses for all RCAF ground personnel. Training Command also provided aircrew training for many NATO nations, producing 1,400 aircrew per year during the early 1950s,⁸⁹ and conducted customized aircrew training courses for Canadian Army and RCN aircrew candidates. Training Command was formed at Trenton in April 1949 and controlled 14 Training Group at Winnipeg. The Command moved to Winnipeg in September 1958 and absorbed 14 Training Group. It was disbanded as an RCAF command in January 1966 on the formation of the new integrated Canadian Forces Training Command Headquarters at Winnipeg.

Conclusions

While the organizational structure of the RCAF changed over time, it always reflected sound organizational principles and recognized the distinction between operational and administrative responsibilities and authorities. The two authorities are inherently different and not necessarily exercised through the same chain of command. During the Second World War, the CAS and RCAF HQ staff retained administrative control of RCAF personnel, but delegated operational control of units to commanders of commands and formations. In the Overseas War Establishment the distinction was more pronounced. While administrative control remained with the RCAF, operational command of overseas squadrons was vested in the RAF and delegated to RAF field commanders (Bomber Command, Fighter Command, etc.). A similar situation existed for overseas RCAF forces in the post-Second World War period, for example No. 1 Air Division was under operational control of Commander 4 ATAF, but was under administrative control of the RCAF.

The building block of air forces is the squadron, comprising crews and aircraft organized to perform a specific function, and which is usually identified in the squadron title or designation, i.e., “Maritime Patrol,” “Transport,” etc. To carry out its primary function, a squadron is equipped with a fleet of appropriate aircraft. Military aircraft are usually designed to carry out a specific air function, and are procured for employment by squadrons tasked to undertake that function. Some aircraft are designed to have “multi-role” capability, but that capability normally exists only within a limited number of roles. Aircraft and squadrons are thus inextricably intertwined; however, fleets of aircraft do not provide the measure of air capability, operational squadrons do.

The wartime experience of Canadian air forces have revealed the following lessons that are still applicable today, especially with expeditionary operations becoming the norm at the beginning of the 21st century. The operational effectiveness of a squadron is dependent on numerous factors, but it is primarily related to personnel and equipment. Personnel need to be adequately trained and established in sufficient numbers to enable a squadron to fulfil its operational tasking. If squadron personnel are deployed frequently or assigned to expeditionary operations on a regular basis, a squadron establishment must include a full, or even over-strength, complement of both aircrew and ground support personnel to sustain expeditionary operations over a long period of time. (This issue is discussed in detail in

⁸⁸ Kostenuk and Griffin, *RCAF Squadron Histories and Aircraft*, 209.

⁸⁹ Desmond Morton, *A Military History of Canada* (Edmonton: Hurtig Publishers, 1985), 236-7.

Chapter 4 of this book.) Centralized base aircraft maintenance and support organizations can be rationalized only in the context of static base operations, and yet these organizations may be impediments to executing expeditionary operations.

To ensure operational effectiveness, the peacetime organization of a squadron and its support elements should reflect its war-time or contingency operational tasking. If peacetime tasking is different (less demanding) than the wartime/contingency requirement (i.e., a peacetime 8 hour day over a 5 day work week versus a wartime/contingency 24 hour capability 7 days a week) then the squadron establishment needs either to include personnel “overages” to support the wartime/contingency tasking, or to create augmentation positions with trained personnel (including reservists) designated to fill these positions during war/contingency operations (i.e., peacetime establishment + augmentation = wartime/contingency establishment). Aircraft and equipment holdings must be similarly considered, and they need to be provided in both numbers and in effectiveness to permit squadrons to successfully undertake their wartime taskings.⁹⁰

The post-war organization of the RCAF initially included both regionally- and functionally-based organizations. Beginning in 1948, however, the RCAF revised its command structure along purely functional lines, culminating in the creation of six major functional commands. These included four operational commands (Air Transport Command, Maritime Air Command, Air Defence Command, and 1 Air Division), plus two support commands (Air Materiel Command and Training Command). This command structure reflected the major operational functions of the RCAF, as well as the importance ascribed by the Air Force to the materiel (logistics) and training functions. This command structure served the RCAF well, and was used as the model for the initial command structure of the unified Canadian Forces.

The RCAF ceased to exist as a military service on 1 February 1968 when the Canadian Forces Reorganization Act came into effect creating the unified Canadian Forces. On that date all serving RCAF personnel, as well as those serving with the Canadian Army and RCN, were transferred to the Canadian Forces and the personnel strength of the RCAF was effectively reduced to zero. However, the units, formations and commands of the RCAF, consisting of 18 operational squadrons, 4 operational training and 6 auxiliary squadrons, had been incrementally realigned within the new CF organizational command structure beginning in 1965.

The advantages of the RCAF command structure over those of the Canadian Army and RCN in creating a new unified force structure was apparent in its selection as the “model” for the new unified command structure of the Canadian Forces. Three of the six major RCAF commands, Air Transport, Air Defence and No. 1 Air Division, were transferred intact (they were essentially re-designated CF vice RCAF commands). And two RCAF commands (Training and Air Materiel) were used to provide the basic foundation structure for similar (but expanded) CF unified commands. While the RCAF ceased to exist as a separate military service, its constituent squadrons and units were retained, and they formed the backbone of the “air element” of the unified Canadian Armed Forces, which is described in the next chapter.

A number of important air force command and control lessons emerge from the 54 years of Canadian experience described in this chapter. Perhaps the most important is that air forces are most efficient when organized along functional lines. For example, the consolidation of all personnel and materiel resources into one command, like Bomber Command, reduces the

90 These issues are discussed in more detail in DND, *The Aerospace Capability Framework*, 19-27.

chances that resources with one purpose will be dispersed and wasted. Likewise, activities like training, which is very expensive and resource intensive for air forces, is most efficient and effective when controlled by one organization with the expertise to organize and administer it. Therefore, the evolution of the Canadian Air Force into six communities, that has been described as inefficient stovepipes by some, actually reflects the most effective and efficient way of organizing air forces. The exceptions to this rule occur when air force units are extremely large or geographically remote from central headquarters, such as when on expeditionary operations. In these cases, it makes sense to organize them into commands that are geographically-based such as the RAF's Middle East Command or the RCAF's regional training commands in the Second World War.

Applying these lessons from the past and putting them in today's terms, it seems fair to say that force generation is best accomplished functionally (in stovepipes) in order to use resources in the most efficient manner possible. Force employment can sometimes be most effective when organized functionally to conduct certain operations, such as the NATO "air campaign" over the Federal Republic of Yugoslavia, which took place between March and June 1999. Although, one could argue that this campaign was a joint campaign because it involved both air and naval air forces.⁹¹ Nevertheless, in today's world where operations are usually joint and combined, air forces provide capabilities, based on the advice of senior air force commanders, to the joint force commander. An important lesson from history is that if the units providing these capabilities are too small, they lack the ability to sustain themselves for any significant period of time. Furthermore, if the units providing these capabilities are thrown together in an ad hoc manner they will not be as effective as formed units that have developed the necessary expertise, cohesion and morale by training together as a team. While the experience of Canada's air force described here does not provide precise answers to every question that might be posed today or in the future, such as what the minimum size of an expeditionary unit might be, it does provide the principles to guide commanders in deciding how best to generate and employ air forces in the future.

Finally, a major lesson learned from the first 54 years of Canada's military aviation history is that leaders at all levels in the air force need appropriate professional development, i.e., training, education and experience, to be successful. In general, Canada's air forces were able to provide this professional development up to the tactical or squadron level, but above that level it was rare for senior air force leaders to get the appropriate command experience that they needed. This had negative effects on both the generation and employment of Canada's air forces, and also interfered with achieving government policy objectives based on providing an identifiably Canadian contribution to its overseas commitments.

⁹¹ See DND, "Operation ECHO," www.forces.gc.ca/site/operations/echo_e.asp. Accessed 29 Nov 2006; and David Bashow, et al., "Mission Ready: Canada's Role in the Kosovo Air Campaign," *Canadian Military Journal* 1, no. 1 (Spring 2000), 55-61, for details of the Canadian Air Force participation in this campaign.

Chapter 3

Unification and Canada's Air Forces 1968–1975: The CF Air Element and the Fragmentation of Command

Introduction

The evolution of Canada's armed forces from three separate services into one unified service began, as we have seen, with the creation of a single Department of National Defence in 1923. A number of small steps towards unification were taken over the next forty years, but the real impetus towards unification came after the Second World War from the first post-war Minister of National Defence (MND), Brooke Claxton. He faced many of the same problems in 1947 that his successors have faced since that time—"what to do in the absence of obvious military threats, how to get the most from the defence budget, and how to ensure that the defence establishment responds appropriately to the direction of government."¹ With the huge post-war cuts in the Canadian military, Claxton's challenges included taking the three separate service departments that had grown in size and stature during the Second World War and reducing not only their size, but also their "institutional and bureaucratic interests and procedures." Overcoming service opposition, he began a process, now referred to as "integration," that took as its guiding principle the requirement to combine, wherever possible, common functions among the services. For example, the medical, dental, legal, and chaplain services, along with some clerical support, in the armed forces were combined. And key headquarters staff functions, such as operations, procurement and personnel were also grouped together regardless of service affiliation. Eventually some 200 inter-service co-ordinating committees were established to try to bring the operating procedures of the services into accord.²

But Claxton realized that this was not enough, and he became "a strong advocate of unification" because he believed that Canadian defence policy had to be approached as a single problem and not be governed by three single-service approaches to defence. Claxton achieved a great deal in his term as MND: he re-established the DND as a single organization, he restored a central defence civil service, and in 1951 he appointed a chairman of the Chiefs of Staff Committee to try to find some consensus among the single-service Chiefs of Staff on the issues that the department faced. Perhaps his most significant unifying action was to have the National Defence Act re-written as the basis for "common laws and regulations governing the armed forces and the code of service discipline," replacing the separate acts governing the three services. Many of Claxton's reforms were the foundation upon which his successors built and which still remain in place underpinning DND today.³

The next major changes in the structure of DND occurred in the 1960s culminating, in 1968, in the unification of Canada's armed forces under MND Paul Hellyer. A number of factors influenced these changes. The most dramatic one was the Cuban Missile Crisis of 1962 during which Canadian military forces responded separately to their alliance commitments and were "largely responsive to allied commanders" and not the Canadian government. When Prime Minister "John Diefenbaker tried to exercise control over the armed forces, he found that the central administration in Ottawa had no national plans, no intelligence

1 Douglas L. Bland, *Canada's National Defence, Vol. 1 Defence Policy* (Kingston, ON: Queen's University School of Policy Studies, 1997), xiii.

2 Marc Milner, *Canada's Navy: The First Century* (Toronto: Univ. of Toronto Press, 1999), 187.

3 Bland, *Canada's National Defence*, Vol. 1, 2, 4-6.

capabilities, and no reliable structure for commanding and controlling the forces.” One year later, the next Prime Minister, Lester Pearson, decided to rectify this situation and appointed “the tough-minded and ambitious” Paul Hellyer as MND. His reforms to DND have been well documented, but a number of key factors are often overlooked in the passionate debates over whether the unification of the forces was required. First of all, Hellyer, while not rejecting the alliance basis of Canadian policy, believed that it needed to be formulated from a more distinctly Canadian perspective. Up to this point Canadian defence policy had been based on “a series of ‘contributions’” to alliances and to the UN “that prompted the development of a disjointed defence establishment centred on three services each with a small operational component.” This led to specialization and fragmentation among the three services and Canadian defence policy lacked a central focus. Hellyer’s unification policy continues to be controversial; however, Bland argues that the effects of unification have been exaggerated because “except for a brief period between 1967 and 1972, unification as envisioned by Paul Hellyer has not been the organizing concept of the Canadian Forces.” Bland contends that over the last 30 years there has been no central concept to guide planners, but rather continuous competition between the “ideas of unification, integration, public service management, and tri-service traditions.”⁴ These factors had a major impact on how Hellyer addressed the challenges he faced with his unification efforts. Many of these factors still have relevance today and can be seen in how the current CDS, General Rick Hillier, is addressing the latest effort to transform the CF.⁵

Nevertheless, from an air force point of view, unification as an organizing concept, especially between the years 1968 and 1975, had a substantial negative impact on Canada’s air force and almost destroyed it as an institution. Canada’s three military services, the Royal Canadian Navy, the Canadian Army and the Royal Canadian Air Force, ceased to exist on 1 February 1968. On that date the Canadian Forces Reorganization Act came into effect, and a single service, the Canadian Armed Forces, officially came into being. The unification⁶ process was complex, its implementation took many years, and almost 40 years later it is still considered by many to be an organizational anomaly. In place of a separate service organized as an air force, the unified Canadian Forces structure included an “air element.” This “air element” consisted of the operational units and personnel of the former RCAF, distributed amongst the new unified CF field commands, but there was no over-arching “air force” structure. In 1975, to correct recognized operational limitations and provide a focus for all CF air programs and operations, a new organization was created—Air Command. This chapter examines the period from unification to creation of Air Command, the only period in the history of Canada’s air force when no central air force command and control framework, of some sort, existed.

Overview of Unification

Prior to unification, Canada’s national defence organization comprised a single Department of National Defence. Within the Department were three independent military services: RCN, the Canadian Army and the RCAF. The head of each service (designated “Chief of Staff”) reported directly to the Minister of National Defence, and was supported by a complete headquarters to control and administer his service. Governments of the day generally viewed this organization as ineffective because advice to the minister was seen as

4 Bland, *Canada’s National Defence*, Vol. 1, 57-9, 62.

5 A comparison between transformation in the CF under MND Hellyer and today under the current CDS can be found in Daniel Gosselin and Craig Stone, “From Minister Hellyer to General Hillier: Understanding the Fundamental Differences Between the Unification of the Canadian Forces and its Present Transformation,” *Canadian Military Journal* 6, no. 4 (Winter 2005-2006), 5-15.

6 Unification is the process by which the three separate services were amalgamated into a single “unified” service.

parochial and often too focussed on narrow single service issues; moreover, coordination between the three service headquarters was problematic. The senior military advisor to the MND, the Chairman of the Chiefs of Staff Committee, was responsible for coordinating service issues through approximately 200 standing “tri-service” committees, but he had no executive authority to implement any committee recommendations.

In 1960 the Royal Commission on Government Organization (the Glassco Commission) focussed its attention on DND. Its report identified numerous shortcomings in the administration of defence, including a dysfunctional committee system, the steady growth of an administrative “tail” in relation to operational “teeth,” and lack of executive leadership. To rectify these problems, the Commission recommended that the Chairman of the Chiefs of Staff Committee be given executive powers, provided with an appropriate staff, and that the position be re-titled “Chief of Canadian Defence Staffs.”⁷

In March 1964, the MND, Paul Hellyer, released a new *White Paper on Defence*. The paper outlined the objectives of the Liberal government’s new defence policy, which, he argued, could not be dissociated from foreign policy. These objectives were: “To preserve the peace by supporting collective defence measures to deter military aggression; to support Canadian foreign policy including that arising out of our participation in international organizations, and to provide for the protection and surveillance of our territory, our air-space and our coastal waters.” The White Paper noted that: “Our major defence contribution for some time will continue to be participation in collective defensive arrangements, namely the North Atlantic Treaty Organization.”⁸

More significantly, the paper went on to review the problems in DND identified by the Glassco Commission and concluded that: “There is only one adequate solution. It is the integration of the Armed Forces of Canada under a single Chief of Defence Staff and a single defence staff. This will be the first step toward a single unified defence force for Canada. The integrated control of all aspects of planning and operations should not only produce a more effective and coordinated defence posture for Canada, but also result in considerable savings.”⁹ This latter point appeared to be critical to Hellyer, as the Glassco Commission had noted that 43 percent of the 1954 annual defence budget was spent on equipment; by 1963 the figure was 13 percent, and it was projected that by 1965-66 there would be no money available for equipment purchases. Therefore, one of the key goals of unification was to provide sufficient savings “to permit a goal of 25 percent of the budget to be devoted to capital equipment being realized in the years ahead.”¹⁰

The White Paper indicated that developing a new unified force structure would be “an evolutionary process.” The new CF structure would group forces according to the major functional roles identified in the paper: NATO Europe; Mobile Forces (both in Canada and for NATO); Air Forces (including additional resources for direct support of ground forces); North American Air Defence; Air Transport (additional resources to enhance mobility of ground forces) and Maritime Forces (including helicopters and fixed wing aircraft).¹¹

As a preliminary move towards total unification, the Government introduced Bill C-90 “Integration of the Headquarter’s Staffs,” which directed the replacement of the separate

7 Douglas L. Bland, *Canada’s National Defence, Vol. 2 Defence Organization* (Kingston, ON: Queen’s University School of Policy Studies, 1998), 74.

8 Canada, Department of National Defence (DND), *White Paper on Defence* (Ottawa: Queen’s Printer, 1964), 5-21.

9 Ibid., 19.

10 Milner, *Canada’s Navy*, 236-7; citation from *White Paper on Defence*, 19.

11 *White Paper on Defence*, 21.

service chiefs by a single Chief of the Defence Staff (CDS) and the creation of an integrated Canadian Forces Headquarters (CFHQ) to replace the three separate service headquarters. Accordingly, as the first step in integrating Canada's armed forces under Bill C-90, Air Chief Marshal F.R. Miller was appointed the first CDS on 1 August 1964. At the same time, heads of new functional branches within the new CFHQ were also appointed.¹²

As the senior officer in the new CFHQ, the Chief of the Defence Staff was responsible to the MND for control and administration of the Canadian Forces. Reporting to the CDS were four functional branch heads: the Vice Chief of the Defence Staff (VCDS), the Chief of Personnel, the Chief of Technical Services, and the Comptroller General. Responsibility for military operations was vested in the VCDS, who had three deputies to assist him—the Deputy Chief of Plans, the Deputy Chief of Operations, and the Deputy Chief of Reserves. Reporting to the Deputy Chief of Operations were three Directors General, each responsible for supervising maritime, land or air operations and for determining operational requirements.¹³

The new CFHQ staff was given the responsibility for determining the makeup of the new CF command structure, consistent with the defence priorities outlined in the White Paper. Following extensive planning and review, a new integrated command structure was announced in June 1965, with direction that all separate service establishments were to be re-allocated to the appropriate new CF commands by 1 April 1966. In Canada, six new functional commands would replace the existing eleven service commands. The two Canadian formations in Europe (1 Air Division and 4 Canadian Infantry Brigade Group [CIBG]) were initially excluded from the reorganization plan.

To complete the unification process, Bill C-243, the “Canadian Forces Reorganization Act,” was placed before the House in November 1966. The Act was a set of amendments to the National Defence Act, which changed the law establishing three services, creating instead one service to be called the Canadian Armed Forces. The Bill also directed the adoption of a standard rank system (so-called “army” ranks) and of a new service dress uniform to be worn by all ranks, irrespective of the commands to which they were assigned. The transfer of personnel between units of different commands would be facilitated by a new unified personnel management system. Royal assent was given to the Bill on 8 May 1967 and unification officially occurred on 1 February 1968.¹⁴

The Reorganization Act, while dissolving the three services, did nothing specifically to affect the units and formations of the services as they were then constituted. At the time the new Canadian Forces came into being, its constituent units and elements were the same ones that existed within the RCN, Army and RCAF, but re-distributed to the new unified CF commands.

The CF Organizational Concept for Unification

The organizational structure adopted for the unified CF was derived directly from the RCAF model. This new CF structure recognized four levels of command: CFHQ (the national level); commands and formations (generally functional organizations, what might be called the operational level today); bases (regional or local support organizations); and units (tactical organizations, like squadrons, assigned to specific commands). At each level of command, there was a designated commander, responsible for the effective and

12 Samuel Kostenuk and John Griffin, *RCAF Squadrons and Aircraft 1924-1968* (Toronto: Stevens, Hakkert and Co., 1977), 148.

13 Bland, *Canada's National Defence*, Vol. 2, 116.

14 Ibid., Vol. 2, 93-8.

efficient discharge of his command responsibilities, as prescribed in Queen's Regulations and Orders. Officers commanding commands and formations exercised command over all bases, units and elements assigned to the command or formation, while commanders of bases and units exercised command over all officers and non-commissioned members at the base or unit.¹⁵

Below the national-level CFHQ, the CF was organized into functional commands which reflected the major commitments assigned by the government. Irrespective of their service origin, all forces devoted to a primary mission were to be grouped in a single command. Command headquarters staffs were to be organized in a structure corresponding to the four branches of CFHQ: Operations, Personnel, Technical Services, and Comptroller. Where warranted, commands were authorized to introduce intermediate headquarters (formations) below the command level.¹⁶

The next level in the vertical organization of the new command structure was the base, which was introduced as the foundation for administration and local support. This organizational concept was derived from the RCAF "station" model, and generally was not found in RCN or Canadian Army force structure. The primary role of the CF base was to support units or formations lodged on, or otherwise attached to it, by providing personnel accommodation and messing, and administrative, technical and comptroller services as required. The units and formations lodged on a base might be largely self-supporting, or totally dependent on the base for support, depending largely on their requirement for mobility.¹⁷

The range and scale of support services provided by a base was to be especially tailored to each unit's situation, but would need to cover the services which were beyond the capabilities of individual units and which were not provided by external agencies. To assist the base commander in executing his responsibilities, a base headquarters was created in a structure that replicated the four branches in the command headquarters and in CFHQ. Bases were assigned to the new parent commands according to the primary operational or training functions being performed by units at the base.¹⁸

Unification and the CF "Air Element"

In the unified CF there was no component of the organizational structure that replicated the former services and use of the terms "navy", "army" and "air force" was actively discouraged. In their place, terminology reflecting environmental "elements" (sea, land and air) was introduced. The term "air element" became the approved term to describe the Canadian "air force" in the CF context. The term was never formally defined, but was generally recognized to encompass all CF units (and their personnel) engaged in, or directly supporting, "air" operations, (e.g., flying squadrons and aircraft maintenance units). Also considered part of the "air element" were all other CF personnel in "air" classifications or occupations (i.e., pilots, air navigators, air traffic control) employed in other than "air element" units.

The absence of an overarching concept of what the "air element" comprised, or of an approved definition, limited the usefulness of the term, except as a generic identifier. Although attempts were made to portray the scattered parts of the "air element" as the

15 Canada, DND, *Queen's Regulations and Orders for the Canadian Forces, Volume 1*, 3.20 – 3.23. available at: www.admfincs.forces.gc.ca/qr_o/vol1/intro_e.asp. Accessed 29 Nov 2006.

16 Canada, DND, *Organization Concept for the Canadian Forces* (Ottawa: Canadian Forces Headquarters, 1967), 9-10.

17 Ibid., 11.

18 Ibid., 12.

CF equivalent of an air force, the inference was incorrect. The CF “air element” had no top-down organizational basis, either administratively or operationally; rather it was a bottom-up aggregation of assorted air units and personnel. CF personnel did not enrol in the “air element,” nor did the “air element” have formal status in the CF organizational structure. These deficiencies would be partially addressed later with the stand-up of Air Command in 1975 and which is described in the next chapter.

Furthermore, while it was frequently suggested that the “air element” was the direct descendent of the RCAF, this was inaccurate. Both the post-war RCN and Canadian Army possessed their own integral aviation forces, and these were also subsumed by the “air element” during the process of unification. Thus, in addition to RCAF units and personnel, the “air element” included all aviation forces previously belonging to the RCN and the Canadian Army. Although more modest in numbers than their RCAF counterparts, these RCN and Canadian Army aviation forces were nonetheless important contributors to the make-up of the “air element,” both operationally and administratively.

Operationally, the pre-unification functions and roles of the RCN and Canadian Army aviation forces were different from (and not duplicated by) those executed by RCAF units. Following unification, these unique RCN and Canadian Army roles and functions were assigned to the CF “air element,” in addition to those carried over from the RCAF. Thus, the number of functions and roles undertaken by the CF “air element” was greater in scope than those previously assigned to the RCAF. In effect, the breadth of operational functions executed by the “air element,” and hence its operational capability, was substantially greater than that of the former RCAF.

From an administrative (personnel) perspective, the differences in training and education provided to personnel engaged in flying operations in the three services were not accommodated in the unification process. These differences were in part related to the inherent differences in the environments in which each of the former services’ personnel engaged in flying operations worked, and were reflected in service-unique personnel policies. In the unified CF, universal training and education policies were applied to all personnel of the “air element,” and because they were frequently modelled on RCAF practice they were not necessarily optimized for air personnel performing functions previously the mandate of the RCN or Canadian Army aviation.

These operational and administrative considerations influenced “air element” organizations and operations, and continue to be reflected in issues related to the “warfare communities” of today. To properly understand the derivation of these “warfare community” issues, it is necessary to appreciate the RCN and Canadian Army lineage of the CF “air element,” not merely its RCAF ancestry. The history and functions of the RCAF have been covered in detail in Chapter 2. An overview of the history of Canadian Army and RCN aviation is provided here to assist the readers in understanding the complexity of the context of the issues affecting the CF “air element.”

Canadian Army Aviation

Canadian Army involvement in aviation began in the closing days of the Second World War, when it became obvious to senior Canadian Army officers that Air Observation Post squadrons were a necessary constituent of a modern army. In June 1944, the War Cabinet approved the formation of three AOP squadrons to support artillery units by providing aerial observation and adjustment of fire. Following British practice, the AOP squadrons were designated as RCAF units, administered and maintained by the RCAF, but the aircraft

were flown by members of the Royal Canadian Artillery. These squadrons were assigned to the RAF Fighter Command's No. 70 Group, and once operational were sent to the continent under the operational control of First Canadian Army. Hostilities ended shortly thereafter, and the three squadrons were disbanded.¹⁹ Nevertheless, the Canadian Army gained experience with and saw the value of the AOP role both in the Italian and Normandy campaigns when British AOP units were attached to the Canadian Corps.²⁰

It was not surprising then that Army interest in tactical air support resurfaced in 1946 when senior Army officers initiated discussions with the RCAF, which was then contemplating the acquisition of new transport aircraft. The Army officers were concerned that their requirements might not be factored into Air Force specifications, and suggested that a committee be established to co-ordinate the air policies and air operations of all three services. The Air Staff agreed to a team composed of mid-ranking officers, but the Army pressed for, and obtained, agreement to constitute a more powerful body. In April 1947 the Joint Air Training School (JATS, later re-designated the Canadian Joint Air Training Centre) was formed at Rivers, Manitoba, to facilitate joint Army and RCAF undertakings. The RCN also used these facilities occasionally.²¹

The Army's newly formed Special Air Service Company, a predecessor of the Canadian Airborne Regiment, was absorbed into the JATS, and one of its first tasks was to instruct personnel in army air transport procedures and parachute delivery. The post-war Army intended to continue to field its own AOP units and 36 Auster Mark VI aircraft were initially acquired from Britain for the AOP role. Training of Army pilots for the AOP units was initiated at the JATS, where other Army activities included helicopter training and communications flights.

Coincident with the formation of 1st Canadian Infantry Division for NATO service, Canada's first post-war AOP flights were formed at Petawawa and Shilo in 1953. Their role was to provide aerial artillery observation, air photography, liaison and reconnaissance capabilities for the Army. In late 1954, more capable US-built Cessna L19 "Bird Dog" aircraft replaced the Austers. In 1960, AOP troops were added to the four artillery regiments (Gagetown, Petawawa, Shilo and Fort Prince of Wales, Germany), and the two original flights were disbanded. The new AOP troops operated under Army regimental control until 1970-71, when they converted to Kiowa helicopters and were absorbed into the 10 Tactical Air Group helicopter squadrons.

The Canadian Army was also convinced of the utility of helicopters in land operations for reconnaissance and logistics duties, and made an initial purchase of some 20 CH112 Hiller Nomad light helicopters. These were used for basic flying training at JATS Rivers, and by the Royal Canadian Armoured Corps in reconnaissance and liaison duties. The Royal Canadian Dragoons (RCD), the armoured backbone of Canada's NATO Brigade, fielded the Helicopter Reconnaissance Troop equipped with nine CH112 helicopters. These were retired in 1972 when the CF acquired the Kiowa helicopters, and the personnel from the RCD troop were transferred to the new 444 Tactical Helicopter Squadron.

19 Kostenuk and Griffin, *RCAF Squadrons and Aircraft*, 143.

20 John D. Gibson, "The Eye in the Sky: The Evolution of Artillery Air Observation, Part II: 1918 to the Present," Office of Air Force Heritage and History, ed., *Proceedings, 3rd Annual Air Force Historical Conference* (Winnipeg: 1 Canadian Air Division, History and Heritage, 1998), 42-3.

21 For more details of RCN tactical aviation and their training at Rivers see Leo Pettipas, "Tactical Air Power and Canadian Naval Aviation, 1946-1962," in William March and Robert Thompson, eds. *The Evolution of Air Power in Canada*, Vol. 2. (Winnipeg, MB: Air Command History and Heritage, 1998), 114-32.

For tactical airlift in the divisional area, the Army purchased 12 CH113A Voyageur medium-lift helicopters in 1963. These were assigned to the Royal Canadian Army Service Corps (RCASC), which formed the No. 1 Helicopter Transport Platoon (HTP) at Rivers. The RCAF purchased six CH113 Labradors, which were similar to the Voyageurs in many ways, for search and rescue (SAR) work. The Army Voyageurs were subsequently modified to the Labrador configuration and re-roled as SAR aircraft in 1975. The RCASC's No. 1 HTP would form the basis of the new 450 (Transport) Helicopter Squadron formed at St. Hubert in March 1968 as a unit of Mobile Command. Ten CH118 Iroquois (Single-Huey) helicopters, which had previously been ordered by the Army, were delivered in 1968 and were assigned to the newly formed 403 Helicopter Operational Training Squadron.

The post-war Canadian Army had become convinced that organic army aviation forces were essential to the effective conduct of land operations, and that they needed to be an integral part of land force formations. Accordingly, it created a small aviation component, comprised of both fixed and rotary wing aircraft. This force was not organized as a distinct or centralized aviation formation, but consisted of individual units that were part of Army branches, like the Royal Canadian Armoured Corps and the RCASC. These units were assigned as required to various field units. Within Army headquarters, a separate Directorate of Land-Air Warfare was established in 1961 to handle the expanding aviation force's operational requirements. Just prior to unification, the Army aviation fleet comprised approximately 60 fixed and rotary wing aircraft and there were approximately 200 qualified Army pilots.²²

The Royal Canadian Navy – Aviation Branch²³

The Royal Canadian Navy, in parallel with the Canadian Army's thinking, recognized late in the Second World War that possessing dedicated fleet air support was essential if it was to operate as an effective maritime force. Therefore, the RCN's Directorate of the Naval Air Division was established in 1944 to pursue that objective, and plans were developed to have two Royal Navy (RN) escort carriers, HMS *Nabob* and HMS *Puncher*, manned primarily by Canadian naval personnel. Canadian ground crews were recruited in Canada and trained in England to man three Fleet Air Arm squadrons for these carriers; the pilots for the most part were transferred from the RCAF.

The development of the post-war RCN Aviation Branch was based on a study conducted in 1943 which proposed the establishment of a Canadian naval air service modeled on the Royal Navy's Fleet Air Arm. The new branch would be carrier-based only, with shore-based surveillance of coastal areas to be provided by RCAF aircraft. The study also recommended that the supporting shore-based facilities in Canada be provided by the RCAF. The RCN developed a proposal for a post-war Aviation Branch based on the recommendations of this study, and it was approved in principle by Cabinet on 19 December 1945.

The new carrier-based RCN Aviation Branch was to be limited to 11 percent of the total RCN peacetime strength of 10,000 personnel, and in early 1946 the RCN took possession of its first aircraft carrier, HMCS *Warrior*, obtained on "loan" from the RN. The initial carrier aviation force consisted of two squadrons of fighters and two squadrons of reconnaissance bombers. The fighters were single-engined Seafires, direct descendants of the famous

22 S.L. James, "The Formation of Air Command: A Struggle for Survival," unpublished MA thesis, Royal Military College of Canada, Kingston, ON, 1989, 53-5.

23 For a comprehensive description of RCN Aviation, see Leo Pettipas, *Canadian Naval Aviation, 1945-1968* (Winnipeg: L. Pettipas, 1986).

Spitfire, and the reconnaissance bombers were Fireflies, two-seat aircraft equipped with cannons, rockets and bombs.

As established in the RCN Aviation Branch charter, the RCAF was assigned funding and management responsibility for all RCN shore-based aviation facilities and supporting services. RCN Aviation operations were centred primarily at RCAF Station Dartmouth, where RCAF support included the provision of all accommodation, stores, major aircraft repairs and overhaul. This “joint” support arrangement did not prove satisfactory to the RCN, however, and in the summer of 1948 the Naval Board opened negotiations with the RCAF to scrap the support arrangement and to transfer RCAF Station Dartmouth to the RCN. By this time RCN Aviation had become the major tenant at Dartmouth, with some 900 personnel operating 56 aircraft from 11 hangars.

Following lengthy negotiations, the RCN assumed responsibility for its own shore-based support. The Dartmouth air station was taken over by the RCN in December 1948 and renamed HMCS *Shearwater*, also known as Royal Canadian Naval Air Station Shearwater. In addition to the four operational squadrons, Shearwater was home to No. 1 Training Air Group, a Naval Stores Depot and the School of Naval Aircraft Maintenance. As well as its main Shearwater facility, the RCN also operated aviation detachments at Patricia Bay, B.C. and at the Canadian Joint Air Training Centre, Rivers. The RCN also had small naval reserve squadrons at Quebec City, Toronto, Hamilton, Calgary and Patricia Bay.

In March 1948, HMCS *Warrior* was returned to the RN and HMCS *Magnificent*, which arrived with the first batch of Hawker Sea Fury aircraft to replace the obsolete Seafires, was received on loan from the RN. In 1950, the Firefly attack aircraft proved unsuitable for the anti-submarine role which the RCN had assumed under the NATO agreement. Consequently, the Fireflies were replaced by Grumman Avenger aircraft purchased from the US Navy. In 1956 *Magnificent* was replaced by HMCS *Bonaventure* (originally the RN’s HMS *Powerful*), and *Bonaventure* holds the distinction of being the only aircraft carrier actually purchased by Canada. The Avengers were also replaced in 1956, when the first of 100 de Havilland-built Grumman Tracker anti-submarine aircraft were delivered.

The RCN entered the jet age in January 1955 with the arrival of its first T33 Silver Star jet training aircraft, obtained on loan from the RCAF. This was in preparation for the November delivery of the first of 39 McDonnell Banshee jet aircraft, purchased from the US Navy to replace the Sea Fury aircraft. The Banshees continued to operate from the *Bonaventure* until September 1962, when as a result of funding and equipment limitations, the RCN’s first and last jet fighter was retired without replacement.

In addition to its fleet of fixed wing aircraft, the RCN was an early proponent of using helicopters in maritime aviation. The RCN’s first helicopters, three Bell 47s (designated HTL-4), were delivered to Shearwater in August 1951 and employed in the search and rescue, aerial photography, recovering ships’ practice torpedoes and light transport roles. In April 1952, the RCN’s helicopter inventory was expanded with the delivery of three Sikorsky S-55s (designated HO4S), for use as a “plane guard” during flight operations from the aircraft carriers. In 1954, a third type of utility helicopter was added to the RCN inventory when a number of ex-US Army Piasecki HUP-3s were taken on strength at Shearwater. These were intended primarily for use aboard the ice breaker HMCS *Labrador* to provide a heavy lift capability.

To provide a rotary wing anti-submarine capability for the aircraft carrier HMCS *Magnificent*, a new helicopter squadron, HS 50, was formed at Shearwater in July 1955. HS 50 was initially equipped with six HO4Ss, which were fitted with dipping sonar and carried depth charges and homing torpedoes. HS 50 was also tasked to study the feasibility of operating anti-submarine helicopters from destroyers. Trials were conducted and culminated with the first landing of an HO4S aboard a St. Laurent class destroyer in July 1958. The success of these trials confirmed the viability of one of the most important innovations in naval aviation, the operation of large anti-submarine warfare helicopters from the small flight decks on destroyers.

The RCN fully embraced this new operational concept and in May 1963 the first of 41 Sea King anti-submarine helicopters arrived at Shearwater to replace the HO4S. The RCN operated the Sea King at sea from both the aircraft carrier HMCS *Bonaventure* and from helicopter-carrying destroyers (DDHs). The carrier normally embarked four to six Sea Kings, along with its complement of ten to twelve Trackers and a single HO4S plane guard. The *St. Laurent* and *Annapolis* class DDHs carried one helicopter whereas the larger *Tribal* Class DDHs accommodated two Sea Kings.

While aviation in the Canadian Army carried out largely support functions, in the Navy it had, from its inception, been considered an essential element in the Navy's operational capability, and, therefore, unlike Army aviation, control of naval aviation was centralized in the RCN Aviation Branch. Whether operated from aircraft carriers or from destroyers, organic aviation assets provided the Navy with the air power capabilities essential in the modern battlespace. Beginning from scratch in 1945, the RCN grew to comprise more than 135 operational and support aircraft and its Aviation Branch personnel numbered close to 2000. With unification, the RCN Aviation Branch, including its two operational squadrons HS 50 and MR 880 and its main station HMCS *Shearwater*, became part of the "air element" assigned to the new CF Maritime Command.²⁴

Unification and Operational and Personnel Considerations

The "air element" of the unified Canadian Forces was an amalgamation of three different organizations: the RCAF (a separate air service), Canadian Army aviation (individual air units in a number of army branches), and the RCN Aviation Branch (a major operational component of the RCN). These organizations had been created in the post-war reconstitution of Canada's three military services, each with some responsibility for operating Canadian military aircraft to achieve defence policy objectives. While all of these organizations carried out various air functions, because the operating environments were different for each service, there was very little overlap in the functions carried out by each organization, and the RCAF, Canadian Army aviation, and the RCN Aviation Branch were inherently different organizations.

At the tactical level, organic army aviation units executed their assigned air functions in direct support of the army field forces. They operated from austere locations in the field alongside the army units and formations they supported, and, therefore army aviation units needed to have an inherent capability to deploy and operate with them. When deployed in the field, logistics support to army aviation units was provided through the army logistics chain. In a similar manner, organic naval aviation forces executed maritime air functions in direct support of maritime surface and sub-surface operations. They operated from surface vessels as part of a ship's company, and were organized to deploy with and receive support

24 Pettipas, *Canadian Naval Aviation, 1945-1968*, 164-5.

from their parent ship. In contrast, air force units executed a variety of combat and combat support air functions, often at some distance and independent from other services or air force units. They operated a variety of larger, primarily fixed wing aircraft, usually from fully developed airfields. Support services were provided at these airfields through air force logistics organizations and were individually tailored to each unit.

While the three constituents of the former services were amalgamated into a single unified CF “air element,” the distinctive operational functions and operating environments of the former services were not (and could not be) similarly unified. Accommodating these inherent differences dictated that the organization and personnel establishment of units undertaking army tactical aviation operations in the field would be different from those of units involved in the conduct of maritime air operations from shipborne platforms, or from air force units involved in operations (whether air defence, counter-surface or air transport) launched from fixed airfields. Logistics support arrangements for these different force structures also needed to be similarly accommodated and specifically tailored to each situation. Based in part on the requirement to deploy with the supported land or maritime force, provision of logistics support for tactical aviation and shipborne maritime air forces through logistics structures of the supported force appeared to be the most appropriate approach. Likewise, air force support capabilities deploying with various types of air force operations required capabilities tailored to each deployment situation.

In part to accommodate the inherent differences in their operational functions and operating environments, the training and professional development provided to officers of the three former services engaged in flying duties varied considerably. While the basic and advanced flying training necessary to achieve pilot “wings” standard was relatively consistent amongst the three services (the RCAF providing much of the flying training to its two sister services), post-wings career opportunities and professional development afforded to junior officers engaged in flying duties in the three services was considerably different.

Following on aircrew training experience gained with RAF Canada in the First World War and the BCATP in the Second World War, the RCAF focus was on recruiting personnel directly for aircrew positions. Distinct aircrew classification (pilot, navigator, radio officer) training was then provided for these direct entry candidates, with only limited emphasis on leadership or general military training. This was appropriate for the RCAF, as most aircrew were engaged under short-service (five year) commissions and only a small percentage (usually university graduates) were offered permanent commissions. Officers with a short-service commission could generally not progress beyond Flying Officer (i.e., lieutenant) rank and hence had little opportunity (or need) to exercise leadership over other RCAF personnel. Officers with a permanent commission had enhanced career prospects, and following an initial period of flying employment were afforded the opportunity to develop their professional and leadership skills. This was accomplished through attendance on staff school and staff college courses and through postings to headquarters staff positions.

Unlike the RCAF, the Canadian Army did not accept direct entry candidates for flying training, but instead took junior officers qualified in their primary branch occupation, (i.e., armour, artillery or service corps), and “cross-trained” them as pilots. This is the approach generally favoured by other allied armies, including, until recently, the US Army. In this army construct, aviation is a secondary qualification awarded to army officers already qualified in a primary occupation qualification. In the Canadian Army, there was no separate “pilot” branch list, officers were held on their primary corps or regimental list, with an additional aviator qualification. Unlike the RCAF, in which an aviator’s career was

irrevocably linked to flying, the Canadian Army aviator was first and foremost an officer of his branch or corps. He could spend only a fraction of his military career engaged in flying operations, and these would be directly related to his primary occupation as an artillery, armoured or service corps officer.

The RCN approach was a combination of the RCAF and Canadian Army approaches. The Navy recruited directly into the pilot branch, but personnel policies ensured that naval aviators were integrated into the mainstream of naval operations and could aspire to and progress to command positions afloat. After an initial flying tour, junior naval aircrew officers were normally given extensive training in general seamanship skills and were also required to qualify in naval operations. Once qualified, they would go on to serve tours as members of a ship's company and ultimately could progress to appointment as captains of surface vessels. Admiral R.H. Falls, who became CDS in 1974, was a naval aviator who progressed to command of not only an RCN air squadron, but also of the carrier HMCS *Bonaventure* and of the Canadian Flotilla Atlantic.²⁵

In the unified CF, training and professional development provided to all "air element" aircrew personnel was generally patterned on the RCAF model. This policy was based on the air force concept of large aircrew classifications (or occupations), focussed primarily on operating aircraft. Personnel were recruited directly into these classifications, extensive training was provided to achieve "wings" standard and subsequent employment operating aircraft was assured for several years. Emphasis in this early part of an aircrew officer's career was placed on gaining experience and skill as an aircraft operator, with limited focus on professional military and leadership skills or on obtaining expertise in "air warfare" functions.

The RCN and Canadian Army had a more holistic career development approach, emphasizing the development and employment of aircrew as professional "naval" or "army" officers, in parallel with development as aircrew. This approach was more appropriate for these services, recognizing that naval and army aviators would be deployed frequently, working in operational environments where regular interaction with military personnel from other units was the norm and where professional competence in all aspects of warfare on land or at sea was required. In the unified CF personnel system, assignment of aircrew officers to and between any of the commands was the norm; however, the universal (air force) training provided to all aircrew was not necessarily optimal for those assigned to maritime- or land-centric commands.

The New CF Command Structure

The new CFHQ defence staff, appointed in August 1964, was given responsibility for planning the make-up of the new CF command structure. Their objective was to create a force structure which would accommodate the roles detailed in the White Paper. The underlying organizational premise was that all forces devoted to a primary role would be grouped into a single command, with sufficient resources assigned to allow the commander of that command to discharge his assigned responsibilities. Following lengthy study and ministerial review, the new CF functional command structure was approved in June 1965.

Under the new structure, the commands in Canada were reduced to six from eleven. Previously a mixture of regional and functional commands, the new CF field structure consisted of six functional commands: Mobile, Maritime, Air Defence, Air Transport, Materiel, and Training. In addition to the six major commands, the CF structure also

²⁵ James, "The Formation of Air Command," 59.

included the Communications System (elevated to command status in 1970), and a Reserves and National Survival Organization. As noted earlier, the two Canadian formations assigned to NATO Europe, 4 CIBG and 1 Air Division, were initially unaffected by this CF reorganization. Commencing in October 1965, commanders were appointed and headquarters were established to fully develop the structure of the new functional commands.²⁶ Each of these is described next.

Mobile Command. The first and largest of the new CF commands, Mobile Command (MOBCOM), was stood up on 1 October 1965 with headquarters at St-Hubert, Que. Its mission was to maintain combat-ready land and tactical air forces (fixed- and rotary-wing) capable of rapid deployment, both for NATO service in Europe and for United Nations peacekeeping operations world-wide. As part of its mandate for rapid deployment, the Command was given command of a new unit, the Canadian Airborne Regiment, whose personnel and equipment could be rapidly deployed in an increased fleet of CC130 Hercules aircraft. The creation of Mobile Command involved the disbandment of four regional Army headquarters: Eastern Command, Quebec Command, Central Command and Western Command, as well as the 11 subordinate area headquarters that had the responsibility for administering some 40,000 Regular, 40,000 Militia and 100,000 cadet personnel.²⁷

A vital component of Mobile Command was to be its tactical aviation element, operating under the Chief of Tactical Aviation. Mobile Command was therefore established as a joint (air-land) command, with a force structure integrating both air and land element units. Its command headquarters organization was equally joint, headed by a “land element” lieutenant general (three star) commander who was supported by two deputy commanders. An “air element” major general (two star) was Deputy Commander – Operational Support, while a “land element” major general was Deputy Commander – Operations. Of the 62 officers in the headquarters, 20 were “air element” officers who were assigned not only to the Chief of Tactical Aviation, but also filled positions throughout the organization.²⁸

In August 1968, the Chief of Tactical Aviation branch was separated from MOBCOM HQ and reorganized as Headquarters, 10 Tactical Air Group (10 TAG), the newly created aviation formation. The Commander 10 TAG was “double-hatted”²⁹ as Chief of Staff (Air) to the Commander MOBCOM and as a commander in his own right of a subordinate formation, 10 TAG. In July 1970, in concert with the latest restructuring of CFHQ, 10 TAG Headquarters was completely separated from MOBCOM Headquarters. The original integrated (joint) air-land headquarters was slowly disappearing, with MOBCOM focussing more on establishing itself as a separate “service,” comparable to the former Canadian Army, but within the context of the unified Canadian Forces.³⁰

These organizational changes had little impact on the development of the MOBCOM aviation component. The aviation force initially included all former Canadian Army aviation units, supplemented by three former RCAF squadrons: 408 Sqn (CC130, CT33) at Rivers, 429 Sqn (Buffalo) at St-Hubert, and 434 Sqn (CF5) at Cold Lake. However, the White Paper had directed a major boost in air resource allocation to support land forces.³¹

²⁶ Bland, *Canada's National Defence*, Vol. 2, 121.

²⁷ John Grodzinski, “Force Mobile Command: The Early Years,” *Army Doctrine and Training Bulletin* 3, no. 1 (Spring 2000), 1.

²⁸ *Ibid.*, 2.

²⁹ “Double-hatted” refers to the organizational practice whereby one individual fills two distinct but related positions in an organization. One is usually a senior staff position, the other a command appointment.

³⁰ *Ibid.*, 2.

³¹ *White Paper on Defence*, 22.

Therefore, plans were prepared for the tactical air forces to expand considerably, ultimately to include four squadrons of new Canadair-built CF5 tactical fighters, a squadron of new de Havilland Canada Buffalo tactical transport aircraft, a squadron of Chinook heavy-lift helicopters, and four squadrons equipped with light (Kiowa) and medium (Twin Huey) helicopters.³²

Over the succeeding years as the new equipment was delivered, numerous new “air element” units had to be created, and the air component of MOBCOM grew considerably, becoming the largest “air force” in the CF. The expansion began in 1967, with the first of 15 de Havilland Buffalo aircraft delivered to the reformed 429 Sqn at St-Hubert. The first of 10 CUH-1H Iroquois “Single Huey” helicopters was delivered in 1968, and assigned to the newly established 403 Squadron at Petawawa. An order was subsequently placed for 50 enhanced CUH-1N “Twin Hueys” to equip four additional tactical helicopter squadrons. 450 Sqn, a new transport helicopter squadron was formed at St-Hubert, and equipped with the former RCASC Voyageur medium lift helicopters. Orders were also placed for 74 Bell OH-58 Kiowa light helicopters, to replace Nomad helicopters and fixed wing L19s.

In 1969 the first CF5 aircraft, of an order for 75 CF5As and 26 CF5Bs, were delivered and assigned to the newly reformed 434 Sqn at Cold Lake and 433 Sqn at Bagotville. The production of CF5s outpaced the CF’s ability to support and employ them, however, and many were never used and were placed directly into storage. In 1970, 408 Sqn at Rivers was disbanded; originally intended to be re-equipped with CF5s, the unit was subsequently reformed as a helicopter squadron at Edmonton.

The year 1971 saw the formation of two additional helicopter units, 422 Sqn at Gagetown and 427 Sqn at Petawawa, and the acceptance of the first of 50 Twin Hueys. In 1972 the first Kiowa’s were delivered and the CH112 Nomads and L19s were finally retired. That same year, 444 Sqn was formed at Lahr, equipped only with Kiowa helicopters, and it was announced that eight CH147 Chinooks heavy-lift helicopters were to be acquired. The first Chinook was acquired in 1974; unfortunately, it crashed during its delivery flight with the loss of all on board. The remaining seven aircraft were successfully delivered to 450 Sqn, now located at Uplands (Ottawa).

With the creation of the new CF command structure, Mobile Command became Canada’s first joint air-land command in 1965, charged with providing forces that could be rapidly deployed. Air and land element officers worked side by side in this headquarters and were responsible for the command and control of this new command. No detailed assessment of the success of these command arrangements has yet been done, but in theory the joint headquarters should have been able to provide a better capability to conduct joint operations than the previous arrangement of single service headquarters. However, five years into this experiment in joint C², the beginning of the “disintegration” of the integrated command structure can be seen when 10 TAG was completely separated from MOBCOM Headquarters.³³ This “disintegration” of the CF continued with the formation Air Command (which will be discussed later) five years after the separation of 10 TAG from MOBCOM. Another sign of “disintegration” of the CF was the closure of the JATS at Rivers in September 1971. It is ironic that this joint school, which was started after the war because of the recognition of the importance of joint training and which was also a

³² Bland, *Canada's National Defence*, Vol. 2, 122.

³³ See Daniel Gosselin, “Unification and the Strong Service Idea,” in Allan English, et al., eds., *The Operational Art: Canadian Perspectives – Context and Concepts* (Kingston, ON: Canadian Defence Academy Press, 2005), 129-200, for a detailed discussion of how the strong service idea contributed to the “disintegration” of the CF.

precursor to today's emphasis on joint operations, was closed as part of a unification base consolidation program designed to save money.³⁴

Maritime Command. Maritime Command (MARCOM) was formally established on 17 January 1966 and embodied all of Canada's surface and sub-surface naval forces as well as all (RCAF and RCN) maritime air units on both coasts. Its headquarters was located in Halifax, with a Pacific sub-command in Esquimaux. The creation of Maritime Command involved the disbandment of the former RCN Atlantic and Pacific Commands as well as the RCAF Maritime Air Command. The primary role of Maritime Command would continue to be anti-submarine warfare, although there was planning underway to enhance its capability for general-purpose tasks.³⁵

Maritime Command was a joint (air-sea) command, with significant contributions from the air and sea elements, and a joint headquarters staff. Prior to unification the RCAF and RCN had instituted a joint command structure comprising three commanders: the Maritime Commander, the Flag Officer Atlantic Coast (FOAC), and the Air Officer Commanding Maritime Air Command (AOC MAC). In peacetime the FOAC was designated the Maritime Commander, with the AOC MAC acting as his deputy. With unification, only the Maritime Commander remained, a position filled by a sea element three star equivalent officer. Senior air element representation in MARCOM was retained by having a two star "air element" general designated as Chief of Staff (Operations), the next senior position in the headquarters. By 1973, however, the senior air position had been downgraded to a one star Chief of Staff (Air), one of three co-equal branch heads in the operations division.³⁶

The Maritime Command anti-submarine force was led by the aircraft carrier HMCS *Bonaventure*, which was, however, undergoing a half-life refit and modernization, from April 1966 through to September 1967, in MARCOM's early days. The seven St. Laurent class destroyers were also being converted to helicopter destroyers, with hangars and flight deck facilities to accommodate new Sea King helicopters. The RCAF contribution to MARCOM consisted of four squadrons: 449 Sqn Summerside (Neptune and Argus aircraft), 415 Sqn Summerside (Argus aircraft), 404 Sqn Greenwood (Argus aircraft), and 407 Sqn Comox (Neptune and Argus aircraft). The RCN Naval Aviation contribution included two squadrons: VS 880 Shearwater (Tracker aircraft) and HS 50 Shearwater (Sea King helicopters).

Over the next decade most of the changes affecting the air element component of MARCOM were related to equipment modernization. In April 1968, the Neptune aircraft flew its last operational mission with 2 (M) OTU at Summerside and it was replaced by the Argus. In December 1969, the last Tracker flights were launched from the aircraft carrier HMCS *Bonaventure* and the ship was decommissioned in April 1970. In July 1972 it was announced that the Argus was to be replaced, and DND began to seek proposals for new long range patrol aircraft. In November 1975 it was confirmed that 18 Lockheed P-3 "Aurora" Long Range Patrol Aircraft would be procured to replace the Argus.

Air Defence Command. In recognition of the importance of air defence during the Cold War and the ongoing Canadian commitments to the North American Air Defence agreement, the Air Defence Command (ADC) organization remained essentially the same as it had been within the RCAF. However, economies were to be achieved through consolidation by moving the Command's headquarters from St. Hubert to North Bay where Northern

34 Pettipas, "Tactical Air Power and Canadian Naval Aviation, 1946-1962," 122.

35 Bland, *Canada's National Defence*, Vol. 2, 123.

36 James, "The Formation of Air Command," 33.

NORAD Region Headquarters was already located. ADC continued to have responsibility for providing airborne interceptors and ground control facilities to defend North American airspace within the mandate of NORAD.³⁷

To execute its responsibilities, ADC operated three squadrons of CF101 Voodoo interceptors, 409 Sqn at Comox, 416 Sqn at Chatham, and 425 Sqn at Bagotville, as well as two squadrons equipped with the Bomarc surface-to-air missile system, 445 Sqn at North Bay and 447 Sqn at La Macaza, Que. These operational forces were directly supported by a number of radars, command and control, and space surveillance facilities. In the years following unification, only a few modest changes affected ADC. In 1970 the “Peace Wings” program was formalized, which saw the exchange of the remaining 58 CF Voodoos for 66 newer replacement aircraft from the USAF, equipped with IR sensors for better target acquisition. In April 1972 both Bomarc squadrons were disbanded and the missiles were returned to the United States.

Air Transport Command. Like ADC, Air Transport Command’s (ATC) organization remained essentially the same as it had been within the RCAF. With headquarters at Trenton, Ontario, ATC was responsible for providing the CF with strategic and tactical airlift capability, as well as air search and rescue operations within the Canadian areas of responsibility. ATC operated a fleet of Yukon and a fleet of Hercules aircraft for strategic transport and a variety of smaller aircraft for tactical transport, communications and search and rescue.³⁸ The four primary transport squadrons were 437 Sqn at Trenton (Yukon aircraft), 412 Sqn at Uplands (Cosmopolitan aircraft), 436 Sqn at Uplands (C130E aircraft) and 435 Sqn at Namao (C130E aircraft).

Subsequent to its re-designation as a CF command, Air Transport Command undertook a renewal of several of its aircraft fleets. In August 1967, seven Dassault Falcons were delivered to 412 Sqn at Uplands for VIP transport, while its remaining eight Caribou aircraft were sold to Tanzania in 1968. In January 1969 the Air Reserve, comprised of six squadrons of Otter aircraft, was transferred from ATC to MOBCOM. In April 1970 the first of five Boeing 707s was delivered to 437 Sqn Trenton for use in strategic airlift role; two were subsequently modified as air-to-air refuelling aircraft. After seven years service with 437 and 412 Sqn, the Yukon was retired from service in 1971 and 436 Sqn moved from Uplands to Trenton. In 1972, ATC took delivery of eight Twin Otters and the first of five C130H aircraft.

Materiel Command. Materiel Command was created on 1 August 1965, with headquarters at Rockcliffe, by amalgamating elements of the former RCN and Canadian Army logistics organizations with the RCAF’s Air Materiel Command. The Command was responsible for providing necessary supply and maintenance support to the other operational commands. Materiel Command was presented with one of the most formidable tasks of the integration period, to mould the three disparate service systems into a single automated CF supply system. Because of the complexity and magnitude of the project, it was estimated it would take up to five years to implement; in the mean time the three service systems would continue to function to ensure that logistics support to operational forces was in no way diminished. The Command had no operational air element units assigned to it.³⁹

Training Command. Training Command was formed on 1 January 1965, with headquarters in Winnipeg, by amalgamating training elements of the RCN and Canadian Army with

³⁷ Bland, *Canada’s National Defence*, Vol. 2, 125.

³⁸ Ibid., Vol. 2, 126.

³⁹ Ibid., Vol. 2, 127.

the RCAF's Training Command. It was assigned responsibility for all individual training, including flying and ground trades training, for all personnel in the CF. A new CF training program was to be developed, which would correspond to a new CF trades structure which was also being developed. Where skills were common to two or more environments, it was planned to centralize the training at one facility. It was anticipated that it would take several years to fully implement the new CF training program. The Command had no operational air element units assigned to it.⁴⁰

NATO Europe – 1 Air Division. The European-based 4 Canadian Infantry Brigade Group, with headquarters at Soest, West Germany, and 1 Air Division with headquarters at Metz, France were initially not included in the 1965 Command reorganization. At the time, 1 Air Division comprised eight CF104 squadrons divided among three wings, with six squadrons in the nuclear strike role based in Germany and two squadrons in the reconnaissance role based in France. In 1966 the French government announced that it was withdrawing its forces from NATO and requested that all NATO forces be withdrawn from its territory. Canada arranged to take over the French air base at Lahr, West Germany in exchange for the Canadian base at Marville, and No. 1 Wing and 1 Air Division Headquarters redeployed to Lahr in April 1967.

As a result of an earlier decision not to procure additional CF104s to replace aircraft lost through attrition, the Air Division establishment was reduced from eight to six squadrons in 1967. The dedicated logistics support flight at Langar in the UK, operating three Bristol freighters, was also disbanded. A further reduction occurred in 1968 when the decision was taken to disband No. 3 Wing as an economy move, and its two squadrons were redeployed to the remaining two wings.⁴¹

In 1970, the Government issued a new white paper, *Defence in the 70's*. This document reversed the government defence priorities promulgated in the 1964 paper, and directed a 50 percent reduction and consolidation of Canada's NATO forces, including the elimination of the nuclear strike role. Under this new policy, 1 Air Division was to be reduced from six to three squadrons, and downgraded from "command" to "formation" status as 1 Canadian Air Group (1 CAG). The three remaining squadrons would all be based at Baden Soellingen and were to be re-roled for conventional ground attack.⁴² This entailed a major modification program for the CF104 to retro-fit the Vulcan 20mm Gatling gun and update the navigation and weapons systems, and also to acquire conventional munitions. On 1 July, 1 CAG and 4 Canadian Mechanized Brigade Group (CMBG) became formations within a new CF command, Canadian Forces Europe, with headquarters at Lahr. The airfield at Lahr was retained as the airhead for Canadian air transport operations in Europe, and as a deployment airfield for USAF "Rapid Reaction" squadrons.

Unification and the Problems of the Air Element

One of the primary objectives of unification was to resolve inter-service rivalries which surfaced when matters of resource allocation or support of one service by another had to be resolved. Prior to unification, the three services functioned independently, sought to maximize their resource allocations and zealously guarded their own service interests. Unification did not directly address resource allocation issues, but moved the decision making authority down in the organization. Resource allocation issues now had to be resolved internally within the CF, generally between the CFHQ and command levels. In

40 Ibid., Vol. 2, 125.

41 Larry Milberry, *Sixty Years: The RCAF and CF Air Command, 1924-84* (Toronto: CANAV Books, 1984), 340.

42 DND, *Defence in the 70's* (Ottawa: Queen's Printer, 1971), 35.

comparison with the land and maritime elements, the interests of the air element were poorly served by the unified CF command structure. The two major joint CF commands, Mobile Command and Maritime Command, were headed by three star officers, who were increasingly stressing their land and maritime lineage, and championing land and maritime programs respectively. The air element, with forces spread amongst four commands, each headed by two star commanders, was at a disadvantage in advancing its programs.

Resource management in DND became the critical issue in the 1972–75 timeframe. The new Defence White Paper, *Defence in the 70's*, issued in 1971 imposed a three year freeze on the defence budget at \$1.8 billion. In the face of severe fiscal constraint, the operational commands were required to significantly reduce their expenditures on operations. The air element commands resorted to mothballing operational aircraft and reducing flying rates to achieve the needed budget cuts. The joint land and maritime commands chose cost reduction options which minimized reductions in their traditional roles, and offered up reductions primarily in their air element activities. As a result, air element programs were disproportionately reduced across the CF.⁴³

This, and similar, experiences prompted many senior airmen to question the logic of the unified Canadian Forces structure given the adverse effect it was having on the CF air element's interests. Through the mechanism of the annual Air Commanders Conference, Canada's senior airmen were able to identify several problems with the unified structure which were considered detrimental to the well-being of the "air element," and which merited concerted attention. The main five problems, as the senior airmen saw them, are described next.

Fragmentation of operational air element forces. Each of the operational CF functional commands had an air element component, but these operated in isolation from each other with no overarching coordination or control. In effect, each command had (or was) its own mini "air force," but with no supporting structure. This fragmented organizational structure violated two doctrinal principles of air power application: unity of effort and centralized control. Experience has shown, and doctrine confirms, that air power is most effectively applied when it is organized as a unified force, and when control of that force is centrally executed at the highest practicable level.⁴⁴

Subordination of the air element. Related to the issue of fragmentation, the growing subordination of the air element within the two "joint" commands, MARCOM and MOBCOM, was a matter of concern. The original senior air positions in these joint headquarters had been downgraded over time, with the result that the "air element" component was no longer perceived as a co-equal partner with the land and sea components, but was increasingly viewed as a subordinate.

Lack of strategic oversight and leadership. Within the CFHQ organization, oversight of air element programs was managed at too low a level, and there was no senior position designated as the air element advocate. Within the VCDS branch, responsibility for CF military operations was vested in the Deputy Chief of Operations branch, with air policy and doctrine being the responsibility of the Director General Air Forces (DGAF)—a brigadier general. This change was significant for the air element, as Canada's air forces went from a pre-integration position of having a three star Chief of the Air Staff with direct access to the MND to a one star officer with three layers of bureaucracy between himself and

⁴³ Milberry, *Sixty Years*, 391.

⁴⁴ Canada, Canadian Forces, Air Command, *Out of the Sun: Aerospace Doctrine for the Canadian Forces* (Winnipeg, Kelman and Associates, 1997), 35-6.

the MND. Even though a 1972 National Defence Headquarters (NDHQ) reorganization elevated the senior air element officer in NDHQ to the two star level, he was still precluded from participating in senior (three star level) CFHQ councils or from providing appropriate strategic leadership to the air element.⁴⁵

Declining esprit de corps. Prior to unification, the Chief of Air Staff, Air Marshal C.R. Dunlap, voiced his concerns over maintaining air element esprit de corps in a unified force: “One joins the Air Force, not a regiment, not a corps – allegiance and pride is centred in the Air Force as a whole – one is willing to make great personal sacrifices for the sake of making the RCAF superior to any other air force or, in fact, than any other service.”⁴⁶ The two “joint” commands were increasingly assuming the mantle of successors to the former services, claiming institutional loyalty and engendering esprit de corps formerly associated with the RCN and Canadian Army. The air element had no similar single institution within which to develop its own esprit de corps.

Professional development and doctrinal deficiencies. Following unification, the land and sea elements had retained their core educational institutions, the Canadian Land Forces Command and Staff College (CLFSC) and the Canadian Forces Maritime Warfare Centre (CFMWC), respectively, while the air element lost the resources previously dedicated to professional education related to air warfare amongst air force personnel. The basic levels of air warfare education that had been provided on entry to the RCAF were not found on the new CF unified basic officer or recruit courses, and at more senior levels the air force promotion and staff college entrance exams were phased out. With the conversion of the RCAF Staff School and Staff College in Toronto to unified CF institutions, professional education directly related to air warfare almost disappeared.

Furthermore, with the conversion of its educational institutions in Toronto to unified CF institutions, the RCAF extension program, which provided professional military education to RCAF officers, and the *RCAF Staff College Journal*, which was the RCAF’s professional journal, were eliminated. These changes also had a detrimental effect on the development of Canadian air doctrine as the RCAF Staff College, since its foundation in 1943, had been one of the key institutions in the development of Canadian air doctrine. Unification did not affect land and sea warfare professional education or doctrine to the same extent because the land and sea elements of the CF kept their core educational institutions alive in the CLFSC and CFMWC. Therefore, air doctrine in the 1970s in Canada degenerated into the views of separate air warfare communities cobbled together into one volume with little coherence or consistency. It was recognized by senior officers both inside and outside of the air force that this situation was threatening to fracture Canadian air power and to divide it into small, divided functional communities that, without central direction, would not be able to provide the air capabilities required by the CF.⁴⁷

Corrective Measures – A Window of Opportunity

Having determined the scope of the problems facing the air element within the unified force structure, Canada’s senior airmen turned their attention to corrective measures. Several proposals were developed, including a suggestion considered by some to be extreme—to put all of Canada’s military air resources into one organization for the first time in its history. In 1974 the senior airmen were provided with a window of opportunity to advance

45 K.R. Pennie, “The Impact of Unification on the Air Force,” in William March and Robert Thompson, eds. *The Evolution of Air Power in Canada*, Vol. 1 (Winnipeg, MB: Air Command History and Heritage), 1997, 108.

46 James, “The Formation of Air Command,” 35.

47 Pennie, “The Impact of Unification on the Air Force,” 108-109.

their ideas. Canada was in the midst of a recession, and cabinet had directed that the DND budget was to remain frozen. DND was in a state of financial crisis, operations were again reduced, capital programs deferred, and the CF establishment was to be reduced from 83,000 to 79,00 in 1975, with possible further reductions to 73,000. The CDS convened an extraordinary meeting with commanders of commands to seek additional areas for possible expenditure reductions.

In response, senior airmen initially proposed the idea of an Air Command based only on an amalgamation of ATC, ADC and some air-related positions in TC, but did not include 10 TAG or maritime air. LGen W.K Carr, the DCDS and an air element officer, actively supported the proposal and offered up manpower savings of 110 positions through consolidating the various air headquarters staffs. As the proposal would have no impact on MOBCOM or MARCOM, there was initially no resistance from those commanders. General J.A. Dextraze, the CDS and a land officer, agreed to take the proposal to government. The MND, James Richardson (a former Second World War RCAF pilot), was strongly supportive, especially as the headquarters was to be situated in his Winnipeg riding. The proposal was forwarded to cabinet, with personnel reductions now identified as 155 positions.⁴⁸

With approval of this partial solution seemingly assured, senior airmen now worked to incorporate 10 TAG and Maritime Command air into the proposal. Additional arguments were prepared to overcome anticipated opposition from MOBCOM and MARCOM commanders, including the exclusion of land and maritime airmen from air element career progression considerations. Commander MARCOM was approached initially with the expanded proposal and he was in general agreement, but with the proviso that operational control of maritime air resources remain with Commander MARCOM. With this precedent established, Commander MOBCOM was finally persuaded to accept the proposal, with similar reservation on retaining operational control of 10 TAG forces. With agreement from these commanders, the CDS agreed to support the expanded proposal, and in January 1975 he announced formation of the new command.⁴⁹

As promulgated in CANFORGEN 15/75 "Formation of Air Command," the CDS explained the decision: "The purpose of forming Air Command is to unify all air resources, regular and reserve, so that their employment and development can be coordinated in the most effective and economical manner to achieve Canadian Defence objectives. Additionally, Air Command will help to provide a clear identity and focus for all airmen within the Canadian Forces..." The new command would encompass all air assets of the Canadian Forces, but with operational control retained by user commands, i.e., Mobile Command, Maritime Command, and CF Europe. The new command would, however, have CF-wide jurisdiction over air doctrine, flight safety and common air policy, including training standards.⁵⁰

Although the CDS had sanctioned the creation of Air Command in January 1975, detailed establishments and command arrangements had not yet been finalized, and it required considerable effort by planners to resolve the concerns of the other commands and NDHQ. In creating the new command structure, air planners had to accommodate three primary restrictions imposed by the CDS: reorganization costs had to be minimal, manpower savings (155 positions) had to be achieved, and command and control arrangements had to be agreed to by all parties affected. In most instances, the existing command and control mechanisms were unique, and tailored for individual situations, and therefore had to be replicated in the new command structure.

48 James, "The Formation of Air Command," 73.

49 Ibid., 80.

50 Ibid., 82.

For example, Air Defence and Air Transport were autonomous commands with complete headquarters staffs. Operationally, Air Defence Command was controlled by the NORAD Commander-in-Chief (CINC) located in Colorado Springs, while Air Transport Command responded to taskings from NDHQ. 10 TAG was a formation of Mobile Command, with some units under operational control of the Land Combat Groups. 1 Canadian Air Group was a formation of Canadian Forces Europe, under operational control of NATO's 4th Allied Tactical Air Force in times of tension and war. Also in Europe, 444 Tactical Helicopter squadron was an autonomous unit assigned to 4 Canadian Mechanized Brigade Group. The air units of MARCOM and the flying schools of Training Command had no intermediary formation, and reported through their associated base and/or ship directly to their parent command.

To accommodate these disparate command and control arrangements, the planning staff developed an initial concept, which organized the command and control of air resources around a number of functional formations, designated "air groups." Each of the groups would provide air support to a specific user command, with split command and control arrangements similar to those existing with NORAD and NATO assigned forces. Under this plan, Air Command would exercise administrative control over all groups, bases, and squadrons, while operational control of individual groups was assigned to the user command. Air Command (AIRCOM) HQ would have a complete staff for administration and technical support, while the group headquarters would be small and responsible only for planning operations. In this concept, base commanders were responsible to AIRCOM HQ for the provision of support to assigned units and responsive to the formation commanders for operational matters.

The initial plan proposed six subordinate groups: Air Defence Group (ADG); Air Transport Group (ATG); Maritime Air Group (MAG); 10 Tactical Air Group (10 TAG); 1 Canadian Air Group (1 CAG); and an Air Training Group. Many of these formations already existed in some form or other, which minimized re-organization costs. To achieve additional personnel savings, a subsequent proposal suggested the elimination of the Air Transport and Training groups, with these functions to be controlled directly by AIRCOM HQ. The elimination of a dedicated Air Transport formation was not supported, however, and the final iteration of the plan was a compromise, leaving Air Transport Group as a separate group but assigning control of air training to AIRCOM HQ.

Once the group structure had been accepted in principle, it remained to finalize headquarters establishments and confirm command and control arrangements with the user commands. While the groups recognized that their responsibilities were limited to operational matters, the two former commands were reluctant to see existing headquarters support staffs dismantled and recreated in AIRCOM HQ. The split control of bases was also seen as a matter of concern, as was the proposed rank (BGen) of the Commander ADG (whose American counterparts were all of MGen rank), and the relationship between the groups and the Director General Aerospace Engineering and Maintenance in NDHQ. Some of these issues remained unresolved until well after the new command structure was inaugurated.

On 2 September 1975, Air Command took its place as a command of the Canadian Forces. With headquarters in Winnipeg (occupying facilities previously accommodating Training Command Headquarters), Air Command became responsible for the provision of "operationally ready regular and reserve air forces to meet Canadian, continental and international defence commitments." To meet that responsibility, it had under its command 29 squadrons, 16 bases, 20 radar stations and 4 early warning radar sites. It operated a fleet of some 850 aircraft of 22 different types, flying over 300,000 hours annually. It was

also responsible for providing trained air personnel for the CF, as well as air advice to the air units deployed in Europe. It comprised 22,829 military and 7,838 civilian personnel, making it the largest command of the Canadian Forces.⁵¹

Conclusions

The unification of Canada's armed forces in 1968 into one service was the culmination of a process, often referred to as integration, which had begun in 1923 with the creation of a single Department of National Defence. A number of factors in the 1960s accelerated change in DND and precipitated the radical changes that unification brought to Canada's armed forces. A key factor was the Cuban Missile Crisis of 1962 when Canadian military forces were perceived by many politicians to have been unresponsive to the Canadian government's wishes in this crisis. The Cuban Missile Crisis also brought to the forefront criticisms of a fragmented and inefficient Canadian military command and control system based on three separate services—the Canadian Army, the RCN and the RCAF. Another important factor that fuelled unification was the perception that the military budget was not being spent prudently because in the mid-1950s close to one half of the annual defence budget was spent on capital equipment, yet by 1963 only 13 percent was being spent on capital equipment, and there were projections that this amount would drop even further in the near future. Therefore, two key goals of unification were to provide an effective C² framework for the CF that would ensure its responsiveness to civilian government control and to provide enough savings to allow 25 percent of the defence budget to be spent on capital equipment purchases.

A number of commentators have questioned the wisdom of unification as it was eventually implemented. While few would quibble with the aims of the proponents of unification of providing a mechanism for co-ordinating Canada's defence policy, of integrating common functions, and of significant financial savings, many ask whether it was necessary to take the unification process as far as it was taken, especially with the creation of a novel command and control structure in a very short period of time.

The first major step towards unification was the reorganization of the military headquarters under Bill C-90, which created the new position of Chief of the Defence Staff to replace the three separate service chiefs and an integrated Canadian Forces Headquarters to replace the three separate service headquarters. The first CDS was appointed in August 1964 and his CFHQ staff devised a new command structure for Canada's armed forces that was announced in June 1965 and was to be implemented by 1 April 1966.

The new structure was based on the RCAF model of functional commands, and it had four levels of command: the national level (represented by CFHQ); functional organizations, what might be called the operational level today (represented by commands and formations); regional or local support organizations (represented by bases); and tactical organizations (represented by units, like squadrons, assigned to specific commands).

The new functional command structure was designed to reflect the major commitments assigned by the government to the armed forces. Therefore, irrespective of their service (i.e., Army, RCN or RCAF) origin, all forces with a common primary mission were assigned to a single command. The result was six new functional commands in Canada, Mobile, Maritime, Air Defence, Air Transport, Materiel, and Training, all stood up before unification in 1968.

⁵¹ James, "The Formation of Air Command," 101.

The next level below the functional command level in the new structure was the base, which was introduced as the foundation for administration and local support. The base concept was derived from the RCAF “station” model, where the primary role of this level in the organization was to support units assigned to it, by providing personnel, administrative, technical and comptroller services as required. The commander of a base, like the commander of a RCAF station, was not in the operational chain of command.

While the official implementation of unification on 1 February 1968 changed some visible characteristics of Canada’s armed forces, such as separate services and distinctive (returning to different colours for the three different environments) uniforms, many organizational changes had already been implemented before that date. Nevertheless, the unification process was complex and Hellyer’s original plans were modified over the years. Many of these modifications were caused by factors that still have relevance today and can be seen influencing General Hillier’s recent transformation efforts.

Among the new functional commands created in the 1960s, as we have seen, Mobile Command and Maritime Command were true joint commands, in today’s parlance. However, not long after the creation of these commands, the centrifugal “strong service” culture began to pull away parts of their structures so that these two commands began to become more like the old army and navy respectively. From an air force perspective, the most visible sign of this “disintegration” occurred when 10 TAG Headquarters was completely separated from MOBCOM Headquarters in July 1970 during a CF restructuring. The effects of this “disintegration” was that Mobile Command and Maritime Command increasingly became centres of influence for the land and sea elements of the CF, both in terms of creating cultural centres of gravity for those elements and in terms of representing those elements in the higher councils of DND. Without a similar centre of influence, the CF air element was perceived by many to be at a disadvantage in the bureaucratic struggles that are part of any large organization like the CF.

Others believed that unification, between the years 1968 and 1975, had almost destroyed Canada’s air force as an institution. The new CF “air element” was a combination of the RCAF, the RCN Aviation Branch and Canadian Army aviation assets. Without an overarching concept or definition of the “air element” in the CF, it became a loose amalgam of air resources dispersed throughout the CF. Each of the operational CF functional commands had an air element component; therefore, each command had (or was) its own mini “air force,” but there was no central command or control framework for CF air resources. This was reflected in CF air doctrine in the 1970s which had little coherence or consistency. The dispersion and diversity of air element personnel plus the lack of a centralized air element command structure, similar to those of Mobile Command and Maritime Command for the land and sea elements respectively, caused a number of problems, for example in the training and professional development as well as the employment of this diverse group of air element personnel.

It is ironic that even though the general organizational principles and some specific organizational parts adopted for the organization and command and control of the new unified CF were derived directly from the RCAF model, their application almost destroyed the air force as an institution. The period from unification in 1968 until the formation of Air Command in 1975 was a difficult one for the CF “air element.” In the new unified CF command structure, operational “air element” forces and personnel were distributed among the four Canadian commands and one European command. As we have seen, this dispersion of air resources had significant effects that included the fragmentation of operational air

element forces among various CF organizations; the subordination of the air element relative to the land and sea elements; a lack of strategic-level oversight and leadership; declining esprit de corps; and serious professional development and doctrinal deficiencies.

In 1974, due to severe budget pressures on the CF, a window of opportunity opened for senior air element officers to attempt to redress these problems. They used this window of opportunity to tout the creation of Air Command as a way to save money and positions, by consolidating numerous air element headquarters positions into a more rational structure, as well as to address these problems. The result was that in September 1975 Air Command, composed of all the air assets and air element personnel from across the CF, became the largest command of the Canadian Forces. The structure that Air Command adopted was not the result of a holistic planning exercise, but, much like the unification process, the result of compromise and reorganization of structures already in being. While perhaps not perfect, it went a long way towards addressing the concerns of Canada's senior air element officers over the fragmentation of air power thought, expertise, and application.

Chapter 4

Canada's Air Force and Air Command 1975–2005: The Struggle to Centralize Air Force Command

Introduction

The CF's air resources were dispersed and fragmented after unification in 1968, which resulted in a number of serious problems in the CF's "air element," as we saw in the previous chapter. Air Command was formed on 2 September 1975 to rectify these problems, including the disjointed command and control of the CF air element and the lack of a central focus for all air operations and doctrine. The creation of this new command was brought about by the amalgamation of two existing CF commands, Air Defence and Air Transport Commands, together with the air elements of Mobile, Maritime and Training Commands. Air Command was created to bring the principal constituents of the CF air element together under a single commander and to permit a more efficient and flexible employment of air resources. With headquarters in Winnipeg, Air Command's first commander LGen W.K. Carr had jurisdiction over air doctrine, flight safety and common air policy matters, such as training standards, for all air units in the Canadian Forces.

The initial euphoria over the creation of Air Command was relatively short-lived as NDHQ did not decentralize any of its day-to-day administrative functions relating to air resources, for example the Chief of Air Operations policy group as well as certain air technical and administrative authorities remained in Ottawa. Furthermore, while a basic argument for the formation of the command had been the rationalization of command and control, the organizational posture adopted by the Command itself seemed to complicate, rather than streamline, command and control of air resources. Changes in the CF's force structure in response to changes in the international environment, in particular détente and the end of the Cold War, also had detrimental effects on Air Command. From a position as the largest CF command when formed in 1975, as a result of major reductions in the CF during post-Cold War period, Air Command shrank considerably and became the second largest CF command. Because of post-Cold War budget cuts, the CF was reduced from the strength of about 90,000 Regular Force personnel that it had grown to in 1990 to approximately 62,000 Regular Force personnel today.¹ However, while the CF Regular Force was reduced by about 20 percent of its total strength as a result of cuts in the 1990s, the Air Force was reduced by 48 percent in the same time period.² Today's Air Force consists of about 14,500 Regular Force military personnel, the smallest Canadian air force personnel establishment since the Second World War.³ While the Air Force was cut by almost one half in terms of both personnel and aircraft in the post-Cold war period, its taskings for expeditionary operations doubled.⁴ During this same period the CF had the number of its personnel deployed on operations increase threefold. This situation is depicted graphically in Figure 4.1.

1 Canada, Department of National Defence (DND), "The National Defence family," www.forces.gc.ca/site/about/family_e.asp. Accessed 4 May 2005.

2 In addition to Regular Force personnel cuts, the Air Force was cut so that it had 69 percent fewer civilian employees, 56 percent fewer aircraft and 59 percent fewer flying hours than in 1989. DND, *The Aerospace Capability Framework*, 45, available at www.airforce.forces.gc.ca/vision/acf_e.asp. Accessed 29 Nov 2006.

3 DND, "Today's Air Force, General Information," www.airforce.forces.ca/today5_e.asp. Accessed 4 May 2005.

4 LGen Ken Pennie, Chief of Air Staff, testimony before the Standing Senate Committee on National Security and Defence, Proceedings of the Standing Senate Committee on National Security and Defence Issue 11 - Evidence, 7 February 2005, available at www.parl.gc.ca/38/1/parlbus/commbus/senate/Com-e/defe-e/11eva-e.htm?Language=E&Parl=38&Ses=1&comm_id=76. Accessed 29 Nov 2006.

During the 30 years covered by this chapter, Air Command changed its organization and command structure frequently in response to internal and external pressures. However, during the last half of the period Air Command found itself increasingly hard-pressed to keep up with the tempo of operations, and its personnel were adversely affected by the extremely high personnel tempo. The Chief of the Air Staff at the time, LGen Ken Pennie, summed up the seriousness of the situation in early 2005: “The air force is ‘beyond the point where even constant dedication is sufficient to sustain the capabilities needed to meet assigned Defence tasks,’ [and the Air Force] ‘remains fragile due to chronic underfunding and asymmetric cuts to personnel. Our Wings and Squadrons are too hollow to sustain the current tempo of operations.’”⁵

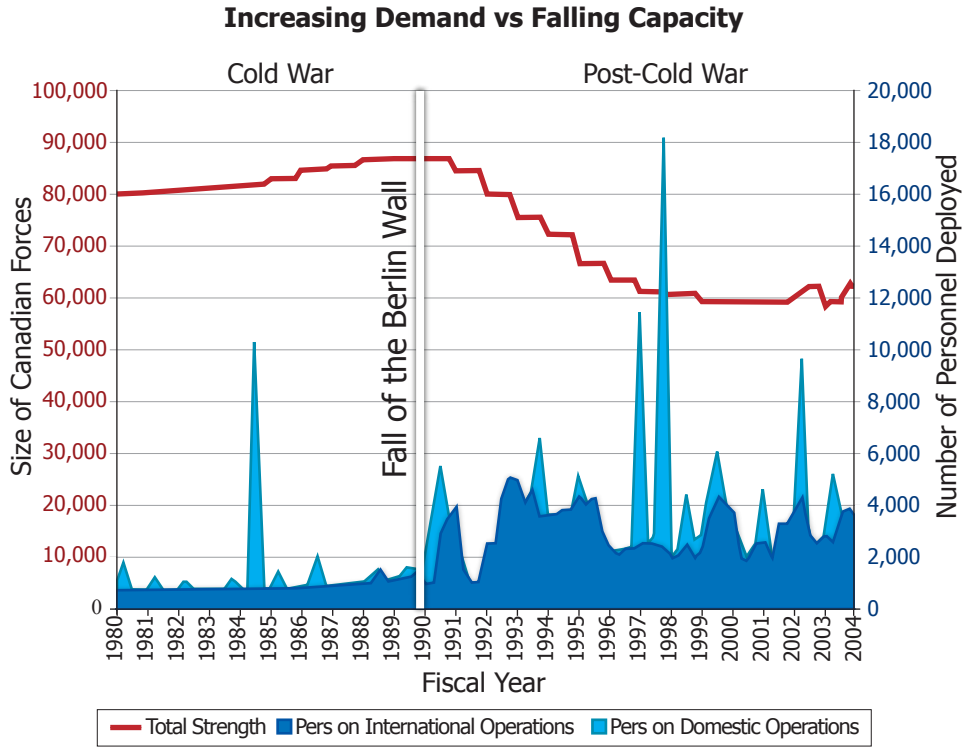


FIGURE 4.1. PERSONNEL OPERATIONAL TEMPO TO OVERALL STRENGTH 1980–2004⁶

This chapter examines the evolution of Air Command’s command and control structure from its inception to today. The first part of the chapter discusses this evolution chronologically in four parts: (1) the period from Air Command’s creation in 1975 during the Cold War until the mid-1980s, (2) the period from the mid-1980s to 1992 which comprised Air Command’s initial organizational response to the end of the Cold War, (3) the reorganization of Air Command based on the “wing” structure” starting in 1993, and (4) the reorganization of Air Command in response to the Management Command and Control Re-engineering Team (MCCRT) starting in 1997. The last part of the chapter examines CF and Air Force operations in the “new world disorder” that has emerged

⁵ Stephen Thorne, “Military money too little, too late: Money in federal budget likely not enough for overstretched military,” *Halifax Herald* (25 April 2005) www.herald.ns.ca/stories/2005/04/25/iCanada112.raw.html. Accessed 26 April 2005.

⁶ Figure from DND, *Defence Policy Statement* (19 Apr 2005) www.forces.gc.ca/site/reports/dps/index_e.asp, 7. Accessed 1 May 2005.

following the Cold War, specifically focussing on the implications for these types of operations on the human dimension of Air Force expeditionary operations.

The Command and Control Structure of Air Command – The First 12 Years

The role of Air Command when it was created was to provide operationally ready air forces to meet Canadian national and international defence commitments. The Commander Air Command had jurisdiction over all air activities in the Canadian Forces, except those under command of Canadian Forces Europe. The incumbent was also a designated NORAD Component Commander, responsible for the readiness of Canadian Forces resources committed to the air defence of North America. In addition, the incumbent was designated as Commander, Prairie Region, with regional responsibilities focussed on provision of aid of the civil power.⁷

The Headquarters Structure. Air Command Headquarters was established in Winnipeg, in facilities previously occupied by Training Command. The headquarters staff was organized into five branches, all reporting to the Commander through the Deputy Commander in his capacity as Chief of Staff:

- Chief of Staff Operations (COS OPS), responsible for overseeing air operations, plans, requirements, doctrine, force structure, intelligence and security;
- Chief of Staff Support (COS SUP), responsible for the provision of support to all air operations, including aircraft maintenance, logistics, telecommunications and information services, and construction engineering;
- Chief of Staff Personnel (COS Pers), responsible for military and civilian personnel matters, including chaplains, doctors, and dentists;
- Chief of Staff Training and Reserves (COS T&R), responsible for air, technical, and professional air force training and education, as well as cadets and reserves; and
- Command Comptroller (CCompt), responsible for accounting and financial services, as well as for the organization and establishment of the Command plus its management consulting services.

The Air Group Structure. The basic organizational concept embodied in the Air Command structure was the doctrinal tenet of centralized control with decentralized execution. This was achieved through a functionally-based field organization, with all operational air resources organized into formations according to their primary operational function and designated “Groups.” The group headquarters were small, and established to exercise operational command over units assigned to the group. This functional organization was designed to permit the group commanders to focus primarily on air operations, while leaving Air Command Headquarters responsible to provide the necessary administrative and technical support functions. This organizational structure also facilitated the transfer of operational control of Air Command forces to the user commands: Maritime Command, Mobile Command, NATO, and NORAD.

As originally established, the Air Command structure included:

- Air Defence Group (ADG). Previously an independent CF command (Air Defence Command) with headquarters in North Bay, this Group was responsible for providing airborne interceptors and ground control facilities to defend North American airspace within the mandate of NORAD. The Group Headquarters was a smaller version of

⁷ Larry Milberry, *Sixty Years: The RCAF and CF Air Command, 1924-84* (Toronto: CANAV Books, 1984), 392.

the former command headquarters, with most support staff positions transferred to the new Air Command Headquarters. To execute its responsibilities, the Group continued to operate three squadrons of CF101 Voodoo interceptors: 409 Sqn at Comox, 416 Sqn at Chatham, and 425 Sqn at Bagotville. These operational forces were directly supported by a number of radars, command and control, and space surveillance facilities. Bases assigned to ADG included Cold Lake, Bagotville, North Bay and Chatham.

- Air Transport Group (ATG). Previously an independent command (Air Transport Command) with headquarters at Trenton, Air Transport Group was responsible for strategic and tactical airlift for the Canadian Forces, as well as air search and rescue operations within the Canadian areas of responsibility. The Group Headquarters was a smaller version of the former command headquarters, with most support staff positions transferred to the new Air Command Headquarters. ATG operated a fleet of Boeing 707 (CC137) and CC130 Hercules transports for strategic transport, and a variety of smaller aircraft for tactical transport, communications and search and rescue. The four primary transport squadrons included: 437 Sqn at Trenton (CC137), 412 Sqn at Uplands (Cosmopolitan, Challenger), 436 Sqn at Trenton (CC130) and 435 Sqn at Namao (CC130). Bases assigned to ATG included Edmonton, Trenton, Ottawa and Gander.
- 10 Tactical Air Group (10 TAG). Previously a formation of Mobile Command, 10 TAG was transferred to Air Command, but retained its headquarters in St-Hubert co-located with Mobile Command. The role of 10 TAG was to provide combat ready tactical aviation (helicopter) and tactical air (fighter) forces to support the operations and training of Mobile Command. Operational control of 10 TAG resources was delegated to Commander Mobile Command, and Commander 10 TAG was also designated Chief of Staff (Air) [COS (Air)] in the Mobile Command Headquarters. The 10 TAG helicopter squadrons operated Kiowa, Twin Huey and Chinook helicopters, and were co-located with their Mobile Command formations. They included 403 Sqn and 427 Sqn at Petawawa, 422 Sqn at Gagetown, 408 Sqn at Edmonton, 430 Sqn at Valcartier and 450 Sqn at Uplands (Ottawa). The tactical air squadrons operated the CF5 Freedom Fighter, and included 434 Sqn at Cold Lake and 433 Sqn at Bagotville.
- Maritime Air Group (MAG). MAG was a new formation, comprising all air assets previously assigned to Maritime Command. MAG Headquarters was established in Halifax, co-located with MARCOM Headquarters. Operational control of MAG resources was delegated to Commander MARCOM, and Commander MAG was designated COS (Air) in the MARCOM HQ. MAG was responsible for the operational tasking of maritime aircraft in providing aerial surveillance and control of the maritime approaches to Canada. To execute this responsibility, MAG operated a fleet of Argus, Tracker and Sea King aircraft. MAG squadrons included 449 Sqn and 415 Sqn at Summerside, P.E.I., 404 Sqn and 405 Sqn at Greenwood, N.S., 407 Sqn at Comox, BC, and VS 880, 406 Sqn, 423 Sqn and 443 Sqn at Shearwater, N.S. Bases assigned to MAG included Comox, Shearwater, Greenwood, and Summerside.

Several changes were made to the Air Command organization in the years following its formation in 1975. The most important were the creation of two new groups, and the restructuring of one of the original groups. The first new group to be created was Air Reserve Group (ARG), formed in 1976 with headquarters at Winnipeg. It was a relatively small formation comprising approximately 950 personnel, and was distinguished by a

unique command and control arrangement which catered to the particular needs of reserve personnel. Under this arrangement, ARG Headquarters exercised administrative control over all Air Reserve personnel; however, the Air Reserve units they belonged to remained under the operational control of the appropriate functional group headquarters.

The second new group to be formed was 14 Training Group, established in August 1981 also with headquarters in Winnipeg. Since its inception in 1975, Air Command training had been controlled directly from the Command Headquarters by the Deputy Chief of Staff Training and Reserves. It became increasingly apparent, however, that training matters were not receiving the staff attention that they required, and that the establishment of a distinct training group was warranted. Therefore, 14 Training Group was created and given responsibility for establishing Air Command training policy and controlling all training units, except for the operational training squadrons which remained under their respective group's control. Coincident with the formation of this new group, the Central Flying School was re-established as the centre of excellence for flying training methods and the central Air Command training standardization body. As an economy measure, 14 Training Group was disbanded in 1994 and responsibility for control of all air training reverted back to Air Command Headquarters.

A third major change to Air Command's organization occurred in July 1982 when Air Defence Group was disbanded and replaced by a new formation, Fighter Group. This new group took over responsibility for the air defence and air sovereignty functions of the former Air Defence Group, as well as the tactical fighter function which had been the responsibility of 10 Tactical Air Group. Fighter Group Headquarters was created by amalgamating 10 TAG Headquarters fighter staff with Air Defence Group staff. This reorganization was in part a result of the acquisition of smaller numbers of one fighter type, the CF18 Hornet, to replace larger numbers of three fighter types of aircraft, CF101 Voodoo, CF104 Starfighter and CF5 Freedom Fighter. With a reduced fleet of only one type of aircraft available for existing commitments, it was deemed critical to consolidate control of all fighter resources and operations under one commander to provide for maximum flexibility in the use of fighter resources.⁸

The Base Structure. While Air Command was organized largely along the functional lines traditionally used by air forces, there was an organizational anomaly—the base. Positioned between the group level and the squadrons and units, commanders of Air Command bases were directly responsible to Air Command for the effective and efficient operation of their bases, and they were also responsive to the appropriate group commander(s) for the operational readiness of the squadrons and units assigned their bases. Since only Air Command Headquarters was established with the requisite administrative and technical support staff to address the needs of the bases, the administrative chain of command went from Air Command directly to the base commanders bypassing the group headquarters. However, the operational chain of command went from Air Command directly to the group commanders, and then to the individual units, effectively bypassing the base commanders. This split chain of command was reflected in the early Air Command organizational diagrams where bases were depicted as reporting directly to Air Command Headquarters, while individual units were aligned under the groups to which they were assigned.⁹

The Air Command base alignment was consistent with CF organizational policy, which was partially derived from the RCAF “station” model. For a number of reasons the CF

⁸ Milberry, *Sixty Years*, 392.

⁹ Annex A to “Air Command Organization,” 1901-3 (SSO O&E) dated 25 March 1987.

base structure initially adopted by Air Command became a major irritant to senior Air Command personnel. Base commanders were generally dissatisfied with their exclusion from the operational chain of command, while group commanders were concerned with their limited ability to influence the prioritization of support functions by base commanders, who were not in their chain of command. To correct these deficiencies and to bring the organization more in line with the original RCAF “station” model, a minor reorganization was undertaken in 1976, which resulted in all operational Air Command bases (excluding training bases) being assigned to the most appropriate group.¹⁰

This revised base alignment introduced a number of organizational inconsistencies, and continued to be a source of dissatisfaction. While bases were now assigned to the air groups, all units at a base did not necessarily belong to the group to which the base was assigned. For example, CFB Comox was assigned to MAG, but supported flying units belonging to MAG, ADG and ATG. As a result, base commanders could now find themselves included in several operational chains of command, with competing demands from the group commanders concerned. Although formalized in Air Command orders, the role of the base commander in the operational chain of command was still not in accordance with CF Organization Orders, nor was it consistent with the original Air Command organizational concept. These organizational inconsistencies remained unresolved until 1992, when the decision was made to reorganize Air Command in accordance with a “wing” organizational structure. This next major reorganization was strongly influenced by changes in the world security situation which are described next.

The End of the Cold War and the Evolution of Air Command’s Command and Control Structure

During the first 12 years of Air Command’s existence, the Canadian government maintained the defence policy promulgated in 1971. However, by the mid-1980s considerable public debate was emerging related to the “rust-out” of CF equipment and over an increasingly evident “commitments-capabilities gap.”¹¹ In 1987 the Conservative government promulgated a new defence white paper, *Challenge and Commitment: A Defence Policy for Canadians*. The aim of this white paper was to address the commitments-capabilities gap, in part through increased defence spending. In the preface the MND announced: “This new defence policy provides a modern and realistic mandate to the Canadian Forces, and commits the government to providing the Forces the tools to do the job.”¹²

Air Command projects announced in the new white paper included North American Air Defence Modernization, (including development of six aircraft Forward Operating Locations), provision of “at least six” additional long-range patrol aircraft, expansion of 1 Canadian Air Group in Europe to five squadrons and its re-designation as 1 Canadian Air Division and modernization of the Tracker fleet.¹³ Unfortunately, the new expansionist defence policy was quickly overtaken by changes in the international environment. In 1989 the Warsaw Pact announced deep cuts to its conventional forces; the Berlin Wall fell in November 1989; and Germany became a unified nation in October 1990. The break-up of

10 Annex B to “Air Command Organization,” 1901-3 (SSO O&E) dated 25 March 1987.

11 This was characterized as the inability of the CF to meet commitments that the government had accepted because of lack of capability and the poor state of its equipment. See Douglas Bland, “Controlling the Defence Policy Process in Canada,” in B.D. Hunt and R.G. Haycock, eds. *Canada’s Defence* (Toronto: Copp Clark Pitman, 1993), 219-24 for a discussion of the “commitments-capabilities gap” at this time.

12 DND, *Challenge and Commitment – A Defence Policy for Canada* (Ottawa: DND, 1987), “Introduction.”

13 Ibid., Chapter 7, “The Way Ahead.”

the Soviet Union in December 1991 marked the end of the Cold War era, and rendered the 1987 White Paper largely irrelevant.

Even before the Cold War ended, expectations of a “peace dividend”¹⁴ were raised in the West, and most Western nations began to reduce military spending in the early 1990s. In Canada, federal budgetary and defence policy documents signalled the impending defence reductions as early as 1989 when the Federal Budget of that year implemented the most drastic defence cuts since 1969. It also announced the closure of some bases, a cut in military personnel and the cancellation of some major equipment projects. Additional fiscal restraint measures were announced in the 1990 budget, and defence cuts over the two budgets totalled \$3.4 billion.¹⁵

In September 1991, the government issued a “Statement on Defence Policy,” which reaffirmed traditional defence commitments, but also announced reductions that included the closure of the CF’s two bases in Germany, and a lowering of the overall personnel ceiling of the Canadian Forces from approximately 84,000 to 76,000. A follow-up “Canadian Defence Policy Statement” was promulgated in 1992, with a continuing theme of fiscal constraint. It announced an additional \$2.2 billion in defence cuts over five years, established a Regular Force personnel ceiling of 75,000 for FY 1995/96 and accelerated the closure of the Canadian bases in Germany by one year (CFB Baden was closed in 1994 and CFB Lahr in 1995). It also indicated that one of the two fighter squadrons at Baden was to be disbanded right away and that CF air operations would cease in Europe by 1993.¹⁶

In November 1993, the Prime Minister announced the initiation of a comprehensive review of defence policy, and a Special Joint Committee on Defence of the Senate and House of Commons was established to consult with Canadians and to prepare a report. Its report noted that defence spending had peaked at \$12.26 billion in 1990-1991, that the February 1994 budget reductions in planned defence expenditures (totalling some \$7 billion over the planning period 1994-1998) were in addition to the previously announced cuts of \$14 billion since 1989, and that these cuts would result in a Regular Force of 66,700 by 1998. The committee believed that this represented “the minimum capability for the CF to play a meaningful role at home and abroad.”¹⁷

In 1994 the government issued a new defence white paper, *Defence 94*,¹⁸ which provided the government’s formal policy response to the end of the Cold War. This white paper incorporated the majority of the findings of the 1993 Special Joint Committee, but added that: “cuts to the defence budget deeper than those envisioned by the Committee will be required to meet the personnel strength of 60,000,” and further noted that the 1994 budget would result in a level of spending on defence in the year 2000 that would be less than 60 percent of that assumed in the 1987 White Paper. The 1994 White Paper also directed DND to reduce personnel and resources assigned to headquarters by at least one-third.¹⁹

In addition to general reductions levied on the CF as a whole, the 1994 White Paper also specifically directed that expenditures on fighter forces and their support be reduced by at least 25 percent. To achieve these savings, Air Command was required to retire the CF5

14 “Peace dividend” is an expression used by many after the end of the Cold War purporting to describe the benefit of releasing resources dedicated to defence to more productive purposes.

15 DND, *The Aerospace Capability Framework* (Ottawa: Director General Air Force Development, 2003), Annex F.

16 Ibid., Annex F.

17 Ibid., Annex F.

18 DND, *1994 White Paper on Defence* (Ottawa: DND, 1994), available at

www.forces.gc.ca/admpol/content.asp?id={73B202D3-9656-4FDC-8A4A-E923C2F68A7E}. Accessed 1 Dec 2006.

19 Ibid., Chapter 7.

fleet of 45 aircraft, cut the cost of fighter-related overhead, reduce annual authorized flying rates and cut the number of operational CF18 aircraft from 72 to between 48 and 60.²⁰ The restricted availability of funds throughout the 1990s led to a number of other Air Command fleet reductions during the period. The other capabilities or fleets eliminated included:

- 63 CH136 Kiowas, 44 CH135 Twin Hueys, 9 CH118 Iroquois and 7 CH147 Chinook helicopters (replaced by 100 CH146 Griffons) between 1991 and 1998;
- 19 CP121 Tracker medium range patrol aircraft in 1990;
- 7 CC109 Cosmopolitan transport aircraft in 1994;
- 45 CF5 Freedom Fighters (loss of tactical reconnaissance function) in 1995;
- 2 CT142 Dash 8 passenger aircraft in 2000;
- 6 CC144E Challengers in 2002; and
- 38 CT133 electronic warfare training and support aircraft in 2002.²¹

The impact of these reductions on the Air Command force structure is depicted in Table 4.1 below.

Community	1989 Air Force	2005 Air Force
Fighter	138 CF18 Multi-Role (96 operational) 43 CF5	80 CF18 Multi-Role (48 operational)
Patrol Aircraft	18 CP140 Aurora LRPA 3 CP140A Arcturus 19 CP121 Tracker MRPA	16 CP140 Aurora LRPA
Maritime Helicopter	33 CH124 Sea King	29 CH124 Sea King (28 new MH)
Land Aviation	7 CH147 Chinook Heavy Lift Helicopter 44 CH135 Medium Transport Helicopter 63 CH136 Light Observation Helicopter	75 CH146 Griffon
Air Transport / AAR	5 CC137 Boeing 707 (2 AAR) 28 CC130 Hercules 10 CC144 Challenger 2 CT142 Dash 8 7 CC109 Cosmopolitan	5 CC150 Polaris (2 AAR) 32 CC130 Hercules (5 AAR) 6 CC144 Challenger (4 govt / 2 mil)
SAR	14 CH113 Labrador Helicopter 15 CC115 Buffalo	15 CH149 Cormorant Helicopter 6 CC115 Buffalo (then new Fixed Wing SAR)

²⁰ Ibid.

²¹ DND, *Strategic Vectors: The Air Force Transformation Vision* (Ottawa: Director General Air Force Development, 2004), 43, available at www.airforce.forces.gc.ca/vision/strategic_e.asp. Accessed 29 Nov 2006.

Community	1989 Air Force	2005 Air Force
Combat Support	9 CH118 Iroquois Helicopters 6 CE144 EW Challenger 42 CT133	10 CH146 Griffon Helicopters 4 CT133 (AETE)
Training/Utility	22 CT134A Musketeer II 9 CH136 Kiowa 136 CT144 Tutor (pilot training and Snowbirds) 4 Dash 8 (navigator training) 7 Twin Otter	Contracted Flying Training and Support Project NATO Flying Training in Canada contract 17 CT144 Tutor (Snowbirds) 4 Dash 8 (navigator training) 4 Twin Otter

TABLE 4.1. AIR FORCE FLEET COMPARISON²²

In concert with equipment reductions, the CF personnel establishment was cut substantially, with Air Command disproportionately affected. During the period 1989 to 1999, the number of Regular Force personnel assigned to the three environmental commands (Maritime, Land and Air) decreased from 56,800 to 42,900 (a reduction of 13,900 personnel), and Air Command Regular Force personnel strength was reduced from 24,100 to 13,300 (a reduction of 10,800 personnel). This was a 45 percent reduction in Air Command personnel, but this represented nearly 80 percent of the total CF environmental command reduction. Air Command civilian positions were also adversely affected, being reduced from 6980 to 2205. This represented a 69 percent reduction of Air Command civilian positions but which accounted for nearly 55 percent of overall environmental command reductions. As a result of these reductions, by 1999 Canada’s air force personnel establishment was the smallest since the Second World War. Over the 10-year period (1989 to 1999) the primary combat power capability of the air force was reduced significantly. Fighter squadrons were cut from seven to four and the total number of operational CF18s was reduced from 96 to 60. The number of Aurora long range patrol aircraft and Sea King helicopters supporting the navy was reduced by two and four aircraft respectively. The land aviation fleets supporting the army were consolidated into a single fleet of 89 Griffon helicopters, which were delivered between 1994 and 1998. As part of the cuts, the number of headquarters reporting to Air Command was reduced from five to two (1 Canadian Air Division in Lahr, Germany had already been disbanded in 1993, coincident with the withdrawal of CF18s from Europe). All these cuts were reflected in the Air Command operating budget which was reduced from \$586.2M in FY 1993/94 to \$421.3M in FY 1998/99.²³

Restructuring in 1993 – The Wing Concept

In part to accommodate the significant reductions in personnel and equipment brought about by declining defence budgets, Air Command initiated planning for a major reorganization in 1992. The most significant aspect of this reorganization was to be the introduction of “wing” formations throughout the Command. This reorganization initiative, based on the wing structure, was approved by the Minister of National Defence effective 1 April 1993. A commemorative booklet issued at the time pronounced the reorganization to be an event of historic significance: “A new chapter has thus been opened in the rich history of Canada’s

22 DND, *The Aerospace Capability Framework*, Annex A.

23 Ibid., Annex F.

military aviation.”²⁴ While perhaps of historical significance, the operational relevance of this major reorganization was less apparent.

The wing had long been a recognized structure in Canadian air force organizations, first appearing in 1919 with the creation of 1 Canadian Wing of the RAF. It reappeared in various configurations during the Second World War, the post-war reorganization, the unification period and ultimately during the stand-up of Air Command. In each of these iterations, the wing was an operational organization, comprising two or more squadrons, usually tasked for the same function (i.e., air transport, air defence, etc.) and under the command of a single commander. Squadrons comprising a wing might be assigned to the same base; however, the primary consideration in establishing wings was command and control efficiency, not squadron location. Historically, not all air force squadrons were assigned to a wing organization, hence the wing structure was not originally intended to be a distinct level of command, applied across an air force structure, but an organizational expedient designed to accommodate force employment realities.

The 1993 Air Command “wing” reorganization was undertaken to address the ongoing concerns of senior air force officers with the CF base structure, in particular with the largely administrative role assigned to air force base commanders and their lack of involvement in operations. Although the post-unification CF organizational structure was generally patterned on the RCAF model, with CF “bases” replacing RCAF “stations,” the principal support function of the CF base was contentious among some senior air force personnel from the time Air Command was first established. As noted in the “Master Implementation Plan for the Wing Concept,” “the underlying philosophy of a ‘base’ as defined in Canadian Forces Organization Orders (CFOOs) has always been foreign and inappropriate to Air Command.”²⁵

From the Air Command perspective at the time, there were five distinct but related problems associated with the CF base structure:

- CF organizational orders established the role of the base as providing accommodation and support services to units assigned to it. This support focus did not align with Air Command’s view that the primary role of an air base was to conduct air operations.
- CF organizational orders placed the commander of an air base outside the operational chain of command. Air Command considered that base commanders were essential command elements in the operational chain of command and that the organizational structure should reflect that operational role.
- The CF base concept was an impediment to the efficient management of resources at an air base because Air Command felt the base commander should be the focal point for command at an air force base with the authority, responsibility and accountability for both operations and support.
- The CF base concept inherently separated the “operations” and “support” functions. It failed to recognize that support to operations at an air base is an integral and vital part of air operations.
- CF base nomenclature did not reflect the operational character of an air force base, nor the air force team concept. For the majority of CF members, the term “base”

24 Canada, Air Command, “Commemorative Booklet – The Formation of Wings in Air Command,” (Winnipeg: Air Command Headquarters, 1993), 1.

25 Canada, Air Command, “Master Implementation Plan for the Wing Concept,” (Winnipeg: Air Command Headquarters, 1993), p. 1-1.

equated to “support,” which was perceived to have little direct relationship to air force “operations.”²⁶

To redress these organizational deficiencies, Air Command initiated a command-wide reorganization, based on a universal “wing” structure. The reorganization was to be accomplished by creating 17 numbered wings, primarily by superimposing a “wing” structure over the existing base organizations. The objective was to create an organization in which one individual would be “double-hatted” as both Wing Commander (WComd) and Base Commander (BComd), and that individual would have clear authority, responsibility and accountability for both the operational role of the wing, as well as for the continuing support role of the base. Within the new Air Command structure, the generic role assigned to a wing was: “to provide ready air forces to carry out operational missions and tasks or, in some instances, to conduct training. Within the wing, the role of the base remains to provide support.”²⁷

The underlying principle for the new wing structure was thus “one wing, one boss,” with the WComd responsible for conducting air operations, while maintaining authority over all those support functions and resources essential to the successful execution of air operations. The “wing” reorganization introduced four principal changes to the existing Air Command structure:

- All Air Command units and elements at a location, including the base where applicable, were assigned to a numbered wing, which in turn was assigned to the appropriate group.
- The commander of an air force installation was designated a formation commander (the Wing Commander), and was placed in the operational chain of command.
- Wing nomenclature (squadrons, flights) was introduced to replace CF base-related terminology (branches, sections).
- Internal organizational changes were introduced, including the incorporation of aircraft maintenance within the operations function.

As originally constituted in 1993, the Air Command wing structure reflected the following numerical designation and group assignment of wings:

- Fighter Group: 3 Wing (Bagotville), 4 Wing (Cold Lake), 5 Wing (Goose Bay) and 22 Wing (North Bay);
- Air Transport Group: 7 Wing (Ottawa), 8 Wing (Trenton), 9 Wing (Gander) and 18 Wing (Edmonton);
- Maritime Air Group: 12 Wing (Shearwater), 14 Wing (Greenwood) and 19 Wing (Comox);
- 10 Tactical Air Group: 1 Wing (Montreal), 2 Wing (Toronto) and 11 Wing (St-Hubert); and
- Air Command Headquarters: 15 Wing (Moose Jaw), 16 Wing (St-Jean), and 17 Wing (Winnipeg).

To assist the WComd in executing their operational and administrative responsibilities, a standardized wing structure was also to be established. Although each wing structure could vary somewhat according to its composition, role and size, all wings would include four

²⁶ Ibid., p. 1-2.

²⁷ Ibid., p. 2-1.

principal branches, generally mirroring those in Air Command Headquarters. Each branch was to be under the direction of a senior officer of LCol or Maj rank:

- Wing Operations Officer (W Ops O) – responsible to the WComd for the efficient and effective conduct of operations;
- Wing Logistics Officer (W Log O) – responsible to the WComd for the effective and efficient conduct of logistics functions;
- Wing Administration Officer (W Adm O) – responsible to the WComd for the efficient and effective provision of personnel administration and personnel services functions; and,
- Wing Comptroller (W Compt) – responsible to the WComd for financial, establishment and information technology functions.

Within the wing organization, the W Ops O was to be considered to be “first amongst equals” of the commanding officers of units in the wing. For day-to-day operational matters the unit COs would report to the W Ops O, who was responsible for coordinating the wing’s response to meet assigned tasks. However, unit COs would continue to have direct access to the WComd for non-operational matters. To enhance the team effort in conducting air operations, all aircraft maintenance activities were consolidated under the purview of the W Ops O, either directly as independent maintenance organizations or as a distinct maintenance component of an operational squadron.

Although widely acclaimed by senior airmen at the time, in retrospect the wing structure reorganization seemed more pre-occupied with addressing perceptions than with reality.²⁸ The underlying objective centred on enhancing the operational role (and perceived importance) of air force base commanders; however, the correlation with increasing operational effectiveness was never made. The secondary objective was a somewhat abstract undertaking to enhance intrinsic bonds between “operators” and “support” personnel at a base. These objectives might well have been accomplished through less drastic measures than imposing a “wing” structure throughout the Command. As few changes were made to the Air Command or group headquarters structures to accommodate the new wing structure, anomalies were introduced to the original organizational concept.

Within the Air Command structure, the air groups had been established as operational formations, with little responsibility (or staff) for administration, while Air Command Headquarters was established to handle most administrative matters. Accordingly, the operational chain of command extended from Air Command through the groups to the individual units, an operational posture which facilitated transfer of operational command to user commands. The administrative chain of command ran from Air Command to the bases and then to the units, an administrative posture which accommodated the absence of administrative staffs in the group headquarters. Double-hatting base commanders as wing commanders not only added the base commander to the operational chain of command, but also required that group commanders become more actively involved in administrative issues, activities for which they were neither staffed nor specifically accountable.

The wing reorganization effectively added a level of command, which was neither required nor consistent with CF organizational principles. It created two levels of formations (groups and wings) below the Air Command level, with little if any operational benefit. Since

²⁸ In discussing the proposed change, the Commander, LGen David Huddleston stated that: “I view the change as critical to the revitalization of the air force’s self image.” David Huddleston, “Canada’s Air Force – Moving Ahead” (Winnipeg: Air Command Headquarters, 1992), 5.

there was limited “operational authority” to spread around, if group commanders were already delegated “operational command” over units assigned to their group, the extent of operational authority they might subsequently delegate to the wing commanders below them was debatable. For those groups that transferred operational control of their units to user commands, the operational role of the wing commander was problematic. Certainly when Air Command units were deployed on expeditionary operations, since the (home) base commander was outside the in-theatre operational chain of command, the role of the (home) base commander in the command and control of deployed units was unclear.

Superimposing a wing structure on existing base organizations also created a regionally-based wing structure, which did not align with the existing functionally-based group structure. The units comprising the newly created wings were merely those currently assigned to the base; hence, there was no functional consistency to the wing organization. Although each wing was nominally assigned to a functional air group, the individual units assigned to a particular wing might well belong to different groups. For example, a CF18 squadron belonging to Fighter Group, but based at a Maritime Air Group base and hence part of that wing (e.g., 19 Wing Comox), would seemingly be operationally responsible to the Commander MAG, while operational taskings would emanate from NORAD/Fighter Group HQ, and be directed only to the squadron.

The Air Command assertion that “the primary role of a base is to conduct air operations” is a simplistic conceptualization with limited application. Air operations are executed by operational air units (flying squadrons), which may or may not be carried out from a particular air base. The degree of base involvement with air operations is directly dependent on the functions being executed. For example, for tactical aviation (helicopter) units and shipborne maritime air detachments, bases in Canada are of little operational relevance. For other aerospace functions, including air transport and tactical air (fighter) operations, air bases can have significantly more relevance, but focussed primarily in the context of providing support and protection rather than command and control.

Not long after Air Command had reorganized according to the “wing” principle, another major reorganization effort was required based on a government mandated CF-wide reorganization.

Restructuring in 1997 – The MCCRT

In response to the recommendations of the Special Joint Committee on Canada’s Defence Policy, the 1994 White Paper announced that a new streamlined CF command and control structure, based on sound military command and control principles, would be put into place by mid-1997, and that, to respond to the need to increase the proportion of operational personnel in the downsized CF, headquarters staff were to be reduced by “at least one third.” Under this structure, the command of military operations would continue to be exercised by the Chief of the Defence Staff, normally through a designated operational commander, but one layer of headquarters was to be eliminated.²⁹

To implement these directed changes, the Department of National Defence established a Management Command and Control Re-engineering Team. This team consisted of 110 personnel devoted to re-engineering activities in all major sectors of the Department. From 1995 to 1997, the MCCRT conducted an end-to-end review of management processes and organizations with a target of reducing the resources dedicated to headquarters (NDHQ) by 50 percent, well above the one third reduction mandated by government. The team

²⁹ DND, *1994 White Paper on Defence*, Chapter 7.

ceased its 30-month effort in June 1997, when the remaining renewal responsibilities were transferred to the Vice Chief of the Defence Staff.³⁰

As part of the MCCRT process, each of the CF commands was given responsibility for conducting companion reviews. The Air Force Command and Control Reengineering Team (AFCCRT) was therefore established, with a mandate to dramatically reduce resource levels associated with the headquarters function of the air force, from a baseline defined by the MCCRT in NDHQ. The objective was to replace the existing air force headquarters structures with a fully process re-engineered, operationally effective command and control structure, but with 50 percent fewer personnel. The foundation for this re-engineering project was the five “core processes” identified by the AFCCRT: strategic direction, force employment, force generation (personnel), force generation (materiel) and corporate services. These were based on, but not identical to, the four core processes developed and used by the MCCRT: strategic direction, force employment, force generation and corporate services. After a lengthy research and planning period, new air force strategic and operational level headquarters structures were developed, approved, and formally established in June 1997.³¹

In implementing the AFCCRT plan, Air Command Headquarters and the four group headquarters were disbanded and replaced by a streamlined command and control structure. This new structure consisted of an “operational-level”³² headquarters in Winnipeg, 1 Canadian Air Division (abbreviated as 1 CAD at the time and now abbreviated as 1 Cdn Air Div) which incorporated Canadian NORAD Region Headquarters and was formally designated 1CAD/CANR HQ, and a “strategic-level” staff organization to support the newly created Chief of the Air Staff position. This new staff, harkening back to RCAF and RAF tradition, was called the Air Staff, and was to be embedded in the MCCRT-redesigned NDHQ structure in Ottawa. Although the Command Headquarters in Winnipeg was disbanded, Air Command continued to exist as a major constituent of the Canadian Forces under command of the Chief of the Air Staff. The former headquarters facility in Winnipeg, the Bishop Building, was used to accommodate the staff of the new 1CAD/CANR HQ.

The Air Staff at NDHQ. Under this new structure, strategic-level direction and command of Air Command was vested in the Chief of the Air Staff. The CAS was located in NDHQ and had two distinct mandates: (1) to act as senior advisor to the Chief of the Defence Staff on air force issues; and (2) to be Commander of Air Command. The Chief of the Air Staff (LGen) heads the Air Staff which includes three general officers, an Assistant Chief of the Air Staff (MGen), a Director General Air Personnel (BGen) and a Director General Air Force Development (BGen). The rest of the Air Staff comprises 13 functional directorates, headed primarily by officers of colonel rank (or civilian equivalent), and includes:

- Air Public Affairs,
- Air Strategic Plans,
- Air Force Employment,
- Air Requirements,

30 Canada, *Report of the Auditor General* (Ottawa, December 2000), para 32.46. For a more detailed analysis of the MCCRT see G.E. Sharpe and Allan English, *Principles for Change in the Post-Cold War Command and Control of the Canadian Forces* (Kingston, ON: Canadian Forces Leadership Institute, 2002), 11-17.

31 Canada, Air Command, “Flight Plan 97 - Executive Summary” (Winnipeg: Air Command Headquarters, 1997), 3.

32 Whether or not 1 Canadian Air Division is actually an operational-level headquarters or not is open to debate. See Allan English, “The Operational Art,” in Allan English, et al., eds., *The Operational Art - Canadian Perspectives: Context and Concepts* (Kingston, ON: Canadian Defence Academy Press, 2005), 6-7 for a discussion of this issue.

- Air Comptrollership and Business Management,
- Air Personnel Production and Development,
- Air Programs,
- Air Staff Coordination,
- Air Staff Operational Research,
- Flight Safety,
- Air Personnel Management and Services,
- Air Civilian Management Services, and
- Air Reserves.

1 Canadian Air Division HQ. Under this new structure, the operational control of Air Command forces was delegated to the Commander of 1 Canadian Air Division headquartered in Winnipeg. Tactical control of air force units was delegated to the 13 wings, equivalent elements and units that comprise 1 Cdn Air Div. The Canadian NORAD Region Headquarters (CANR) was integrated into the headquarters in Winnipeg as the Commander of 1 Cdn Air Div (MGen) also commands the CANR and is supported by a Deputy Commander (NORAD Region—a BGen USAF). 1 Cdn Air Div HQ was organized according to the continental staff system, and includes seven main staff divisions, headed by officers of varying ranks:

- A1 – Personnel and Training (BGen),
- A2 – Intelligence (LCol),
- A3 – Operations (BGen),
- A4 – Support (BGen),
- A5 – Review and Corporate Services (Col),
- A6 – Telecom and Information Services (LCol), and
- A7 – Plans and Doctrine (Col).

Wing Headquarters. Part of the AFCCRT mandate was to determine if, in developing the new command and control structure, disconnects with the wings had been introduced. It was also tasked to determine the most effective means for the new structure to interface with the wings and ensure optimum generation of mission ready air forces. One proposed initiative in this regard was to create “A-staffs,” based on the original 1 CAD HQ model, at each of the wings to ensure consistent points of entry for operations-related activities. The AFCCRT team was dismantled before this initiative was completed, and most wings continued to function with the four-branch organization introduced with the 1993 “wing” reorganization.

A Critique of the AFCCRT. Considerable effort was expended by the AFCCRT in studying and re-engineering the air force command and control structure; however, the result has a number of organizational inconsistencies. For example, the AFCCRT identified five “core processes” as the foundation of the re-engineering effort, but the correlation between these and the command and control structure produced by AFCCRT is not readily apparent. If the five AFCCRT processes were indeed “core” to the air force’s day-to-day operation, then the organizational precept of “departmentalization” would dictate that these processes should form the basis of the air force command and control organization. In effect, there should

be five principal branches in the headquarters, each responsible for overseeing one of the “core” processes, i.e., Director Strategic Direction, Director Force Employment, etc.

Yet this approach was not taken, and neither the 1 CAD “A-staff” structure nor the NDHQ/CAS Air Staff organization was aligned with the five AFCCRT core processes. (It should be noted that Air Command was not alone in this practice, as NDHQ did not reorganize around the “core” MCCRT processes either.) While the Air Staff structure in Ottawa includes some AFCCRT terminology, the organizational model is not directly derived from its core processes. The new 1 Cdn Air Div HQ organization, on the other hand, seems to be essentially a “slimmed-down” version of the former Air Command HQ structure, overlaid with a modified version of an air force “continental” staff system,³³ employing “A-staff” designations (A1, A2, etc.), which were not part of the AFCCRT project.

Most surprising in this reorganization process is the absence of any evidence of the application of the air force dictum of “centralized control and decentralized execution” in the design of the new command and control structure. This was deemed to be the overriding consideration in the design of the original Air Command / group structure in 1975, but it seems to have been ignored in the AFCCRT redesigned structure. There is also no evidence of any distinction between the operational and administrative chains of command in this new structure. In the original Air Command structure, the group headquarters were only in the operational chain of command; however, in the AFCCRT version of this structure 1 Cdn Air Div HQ is effectively in both. Since Air Command and its subordinate formation 1 Cdn Air Div are essentially the same organization, a natural division of responsibility and authority between their commanders is not readily apparent. Although the terms “strategic” and “operational” are used to describe the mandates of the two headquarters, it is unclear whether 1 Cdn Air Div HQ is intended to be an “operational-level” headquarters or whether it is an “operational” headquarters in the sense of a headquarters that directs the conduct of operations.³⁴

Furthermore, while the former Air Command structure reflected the importance of the major operational air force functions, as embodied in the functional group headquarters structures, the AFCCRT-designed headquarters almost totally ignores them. The operational functions (air transport, SAR, etc.) are the primary “outputs” of the air force, and, therefore authority and responsibility for their provision should be readily identified at all levels of the Air Command organization. Within the Air Staff, however, there is no identifiable staff accountability for any of the air functions, while within 1 Cdn Air Div HQ, only the A3 Ops Readiness division has discrete sections dedicated to each of the air functions. In the absence of formal organizational structures focussed on functional capabilities, the Air Force has instituted two ad hoc constructs to mitigate this omission: the Air Force Capability Framework (AFCF) and Capability Advisory Groups (CAGs).³⁵

The Air Force Capability Framework. At the same time as the Air Force dismantled its functionally-based group structure, it introduced the Air Force Capability Framework.³⁶ First promulgated in the Air Command 1996-2001 Business Plan, this was primarily a

33 The Continental staff system is organized into six principal functions: Personnel (G-1), Intelligence (G-2), Operations (G-3), Logistics (G-4), Plans (G-5) and Communications (G-6). DND, *Canadian Forces Doctrine Development*, A-AE-025-000/FP-001 (Ottawa: NDHQ, J7 DLLS 2, 2003), p. 1-13, available at: www.cdcs.forces.gc.ca/jointDoc/docs/docDev_e.pdf. Accessed 29 Nov 2006.

34 For a discussion of differences in the use of the word “operational” in this context see English, “The Operational Art,” 6-7.

35 CAGs are also referred to as “Air Warfare Communities.”

36 The AFCF is also referred to as the “Air Command Capability Structure” in some publications.

construct to explain how the air force would structure and prepare itself for the delivery of air power. It was designed to capture the entire spectrum of air force operational and support activities and outputs. The AFCF also provides the framework for producing all air force business plans, and forms the output base line for activity-based costing and resource management across the air force. As such, the AFCF is the single most important element of the business planning and resource management methodology in the air force.³⁷

The AFCF is comprised of six operational capabilities, AFs 1–6 and three support capabilities, SCs 1–3. The six operational capabilities are:³⁸

- AF 1. Aerospace Control – provide national aerospace surveillance, enforcement, offensive air capabilities, air-to-air refuelling, and management, which contribute to the collective defence arrangements of Canada, North America and CF operations worldwide;
- AF 2. Air Support to Maritime Component – provide air support to the maritime component for the enforcement of Canada's sovereignty over its maritime approaches, for the collective maritime defence of North America and for CF operations worldwide;
- AF 3. Air Support to Land Component – provide air support to the land component for the enforcement of Canada's territorial sovereignty, the collective land defence of North America and for CF operations worldwide;
- AF 4. Air Mobility – provide routine, and when directed surge, air transport services in support of CF operations at home and worldwide;
- AF 5. Support to National Interests – provide on-demand search, rescue, emergency and utility airlift, jurisdictional, and air support services in concert with other government agencies and in support of the national well-being and interests within Canada and internationally as required; and
- AF 6. Contingency Support – provide specialized air wing support services for the collective defence of North America and for CF operations worldwide.

The three support capabilities are:

- SC 1. Command and Control – operate a command structure which can manage and control all allocated and assigned formations, units and other elements in the execution of their respective missions alone or as part of a joint headquarters formation, and can participate in collective defence arrangements of North America or CF operations worldwide;
- SC 2. Force Generation – operate a personnel training, infrastructure, and equipment generation capability that yields a capable fighting force employing assigned resources in the execution of their mission elements in the defence of Canada's territorial sovereignty, the collective defence of North America and for CF operations worldwide; and
- SC 3. Mandated Programs – execute a variety of cross-capability, long-term activities and short-term initiatives over the planning period as directed by the Government, NDHQ or as initiated by Air Command.

The AFCF was first developed in 1995, at approximately the same time as the AFCCRT was first established, and yet it appears that its use was and still is restricted to the business planning process. There is no indication that the AFCF was in any way incorporated into the AFCCRT planning deliberations or any evidence that it influenced the final design of

³⁷ "Air Force Level 1 Business Plan 2001" (Ottawa: Chief of the Air Staff, 2001), Annex A.

³⁸ As originally promulgated in the "Air Command 1996-2001 Business Plan" (Winnipeg: Air Command Headquarters, April 1996), 3. Descriptions have been modified over time.

the new Air Command Headquarters structure. Although there may be some debate on the specific terminology associated with some of the capabilities included in the AFCF, the construct of operational and support “capabilities” presented in the AFCF appears far more relevant to establishing an appropriate command and control structure for the air force than do the “core processes” identified by the AFCCRT.

Capability Advisory Groups. With the dissolution of the Air Group structure in 1997, an informal approach to the governance of the Air Force’s functional communities evolved in the form of a number of ad hoc, community/capability-based advisory groups. In line with the formalization of the governance structure at the Air Staff level, the development of authoritative terms of reference for these Capability Advisory Groups (CAGs) was undertaken at 1 Cdn Air Div HQ to formalize their activity, and to ensure that appropriate linkages and communication existed between all levels of command and control.³⁹

As mandated by 1 Cdn Air Div Orders, the following eight CAGs were established:

- Fighter Capability Advisory Group (FCAG) – Related to the conduct and sustainment of fighter operations.
- Maritime Air Advisory Group (MAAG) – Related to the conduct and sustainment of long-range patrol and maritime helicopter operations.
- Air Mobility Advisory Group (AMAG) – Related to the conduct and sustainment of transport and search and rescue operations.
- Tactical Aviation Advisory Group (TAvnAG) – Related to the conduct and sustainment of tactical aviation operations.
- Aerospace Control Advisory Group (ACAG) – Related to the conduct and sustainment of aerospace control operations (to include space operations).
- Training Advisory Group (TrgAG) – Related to the conduct and delivery of training and development activities not forming part of other air force capabilities.
- Air Reserve Advisory Group (ARAG) – Related to Reserve issues not forming part of other air force capabilities.
- Air Combat Support Advisory Group (ACSAG) – Related to the provision of security, medical, airfield engineering and logistics support, and command, control and communications operations. Note: In 2003 the A3, 1 Cdn Air Division directed that the term Support Capability Advisory Group (Sp CAG) be used instead of ACSAG.⁴⁰

The mandate of the CAGs is to provide a recognized mechanism for community/capability-based leadership consultation and decision-making, and to enhance the promulgation of direction in support of the Commander 1 Cdn Air Div. The CAGs supplement and complement existing staffing and associated processes by enabling focussed discussion and decision making by subject matter experts in each of the capability areas. The CAGs have three main areas of interest: personnel, capability issues and directed issues.

It is noteworthy that, with the exception of the Sp CAG, this listing of CAGs replicates the former functional group structure and closely resembles the capabilities described in the AFCF. This suggests that there is an inherent “functional” bias in the day to day functioning of the Air Force, which is not reflected in the AFCCRT-developed headquarters structure. Therefore, in the absence of an effective functional organizational structure,

³⁹ DND, *1 Canadian Air Division Orders, Vol. 1*, “Capability Advisory Groups – Terms of Reference,” p. 1-624.

⁴⁰ Source for the note is a communication from LCol Marty Playford.

matrix organizations and frameworks have been developed to advance functional issues within the headquarters.

Systemic Problems with Air Force Re-organization and Transformation. Throughout the 30 years covered by this chapter, there have been systemic problems that have impeded Air Force re-organization and transformation efforts. First of all, despite a series of strategic planning and change initiatives over the past 20 years, the Air Force has been unable to bring any of them to fruition in a coherent and effective way.⁴¹ Rather, change, as we have seen, was ad hoc and in reaction to various pressures.

Many of these ad hoc change processes were symptomatic to the CF as a whole in this period. As General Ray Henault (a former ACAS, DCDS and CDS) observed, the CF did not have a responsive lessons learned capability in the 1990s and this hampered the ability of the CF to improve its organization, doctrine and procedures.⁴² This problem was also identified in 2004 by students at the Canadian Forces College when they were attempting to research recent Canadian Air Force operations. They found that information was hard to come by and that “[l]essons learned reports concerning operational level issues are clearly lacking.”⁴³

Furthermore, during the post-Cold War period, the CF C² structure evolved at a rapid pace while that structure was overseeing ongoing high intensity operations. To add to these challenges, change was carried out in lean times for the CF as budget cuts in previous years had reduced CF capabilities, and no budget increases were planned to fund the many new operations that the government committed the CF to undertake in the post-Cold War world. General Henault described the CF change efforts in this era like “changing the tires on a moving car.”⁴⁴

The Canadian Air Force was at a particular disadvantage compared to the Army and the Navy in this era because, as Leversedge has argued, the Air Force’s strategic planning process “has suffered from a chronic shortage of both resources and procedural rigour [and]... The current NDHQ construct and internal division of responsibilities creates further problems, which compound the existing Air Force process difficulties.”⁴⁵ Throughout the period covered by this chapter, the Air Force was further handicapped because it was incapable of producing any meaningful doctrine to address the challenges it faced. In one notable effort to address the doctrinal problem, the Commander of Air Command, LGen Paul Manson, convened an Air Doctrine Symposium at CFB Trenton in January 1984. However, it achieved very little of a concrete nature, and the Chief of the Defence Staff, attending as an air force officer, criticized the participants’ use of self-serving arguments for specific doctrine to justify new equipment acquisitions rather than deal with the air force’s

41 T.F.J. Leversedge, “Transforming Canada’s Air Force: Creating a Strategic Planning Process,” in Allan D. English, ed., *Air Campaigns in the New World Order*, Silver Dart Canadian Aerospace Studies Series, Vol. 2 (Winnipeg: Centre for Defence and Security Studies, 2005), 130-1. BGen Leversedge wrote this essay when he was a student on the National Security Studies Course. He is currently Deputy Commander Mission Support and Training in 1 Cdn Air Div HQ.

42 General R.R. Henault, Brigadier-General (retired) Joe Sharpe and Allan English, “Operational-Level Leadership and Command in the CF – General Henault and the DCDS Group at the Beginning of the “New World Order,” in Allan English, ed., *The Operational Art: Canadian Perspectives - Leadership and Command* (Kingston, ON: Canadian Defence Academy Press, 2006), 135-61. General Henault served in a number of important positions in NDHQ during this period including ACAS, DCDS, and CDS.

43 Rachel Lea Heide, “Canadian Air Operations in the New World Order,” in Allan D. English, ed., *Air Campaigns in the New World Order*, Silver Dart Canadian Aerospace Studies Series, Vol. 2 (Winnipeg: Centre for Defence and Security Studies, 2005), 79.

44 Allan English and Joe Sharpe, “Lessons Learned from the Perspective of a Chief of the Defence Staff,” *Bravo Defence* vol. 5 (Summer 2005), 13.

45 Leversedge, “Transforming Canada’s Air Force: Creating a Strategic Planning Process,” in Allan D. English, ed., *Air Campaigns in the New World Order*, 148.

fundamental problems.⁴⁶ Up until 2005 with the creation of the CF Aerospace Warfare Centre, the Air Force has relied on ad hoc methods and temporary working groups “to review and resolve doctrinal issues,” with little success.⁴⁷ Finally, Leversedge notes that the most recent Air Force transformation efforts are handicapped by flaws both in the content and in the process used to create the latest transformation document, *Strategic Vectors*.⁴⁸

While the Air Force was re-structuring itself in the post-Cold War era, largely in response to budgetary pressures and government policy directives, the nature of CF and Air Force operations was changing. For a number of reasons, not the least of which were the lack of an effective Air Force (and CF) lessons learned process and a rigorous doctrine development process, the magnitude of the change in the nature of operations was not obvious to those doing the re-structuring. Nevertheless, the changes occurred, and it is important to understand them because current CF transformation initiatives are predicated on the reality of CF and Air Force operations in the current “new world disorder.”

“The New World Disorder” and CF Air Force Operations

Context. In the post-Cold War period the CF and the Air Force have participated in two major categories of operations: routine and contingency. Routine operations take place on a regular basis, and forces are specifically tasked, organized, and equipped for these pre-planned operations. Contingency operations tend to be launched in reaction to a crisis or a natural disaster and forces are generated as necessary to meet the specific needs of every

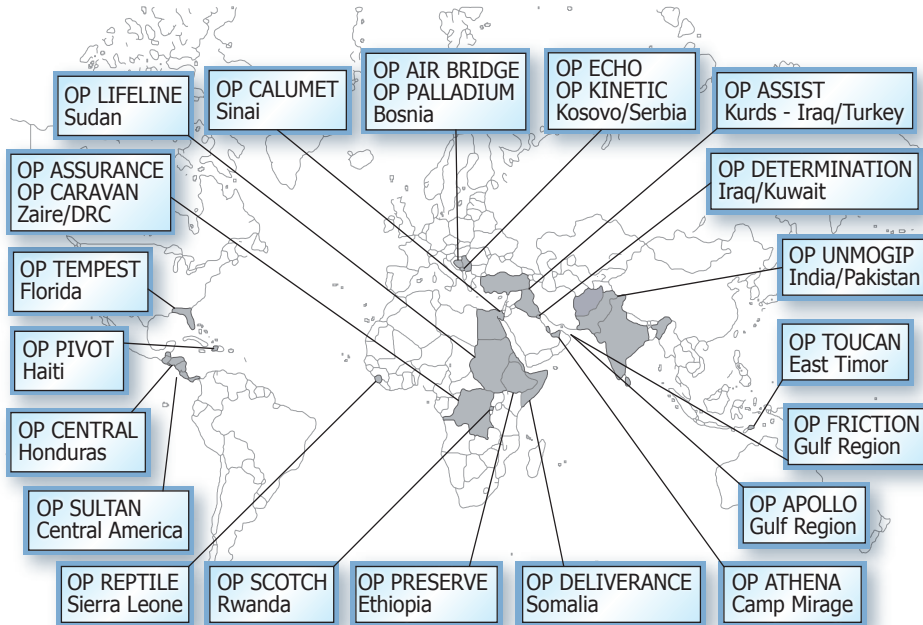


FIGURE 4.2. INTERNATIONAL CONTINGENCY OPERATIONS: 1990–2004⁴⁹

46 General G.C.E. Thériault, (the Chief of the Defence Staff at the time) cited in “Air Doctrine Symposium: Minutes of the Discussion Period,” 1180-3 (SSO C&D) dated 22 February 1984, in Air Doctrine Symposium Summary of Proceedings, copy at CFC Library, 3.

47 Aerospace Doctrine Board: Terms of Reference and SOPs, copy at CFC Library, 1-2, 2-1; and John Westrop, “Aerospace Doctrine Study,” unpublished report dated 30 Apr 2002, copy at Canadian Forces College library.

48 Leversedge, “Transforming Canada’s Air Force,” 148-9.

49 Figure based on Rachel Lea Heide, “Canadian Air Operations in the New World Order,” 91.

mission. Both routine and contingency operations can take place in either a domestic or an international context. Domestic contingency operations usually consist of the CF providing aid to the civil power, while for international contingency operations CF missions are initiated by the government in support of its foreign policy objectives.

The most visible and most publicized operations conducted by the CF are “crisis” international contingency operations that are mounted in response to an international crisis or natural disaster. In addition to “crisis” contingency operations, since the end of the Cold War the CF has conducted standing and continuous commitments for NATO, for NORAD, and in the Balkans.

Large forces, by Canadian standards, have also been deployed to South-West Asia, the Middle East, Bosnia and Africa. All of these recent contingency operations have involved significant Air Force participation in roles such as strategic airlift, tactical transport, combat and surveillance, and all of these roles have required significant support resources. The Air Force has participated in approximately 20 international contingency operations since the end of the Cold War as illustrated in Figure 4.2. In addition, Air Force support personnel have also deployed in support of most Army and many Navy contingency operations where no Air Force operational assets were deployed.

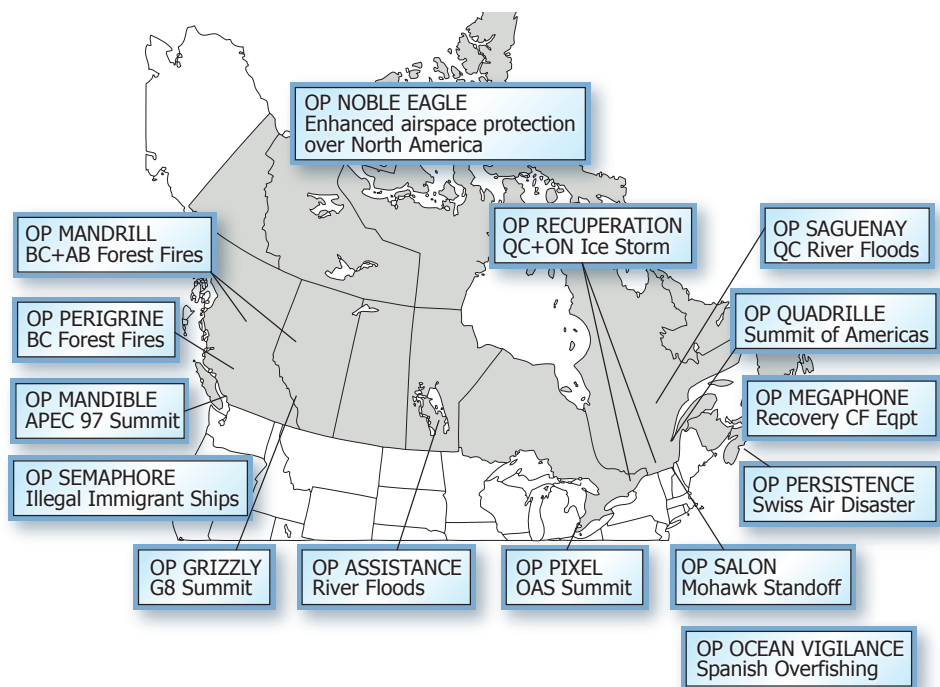


FIGURE 4.3. DOMESTIC CONTINGENCY AIR OPERATIONS: 1990–2004⁵⁰

While participating in an increasing number of international contingency operations and maintaining Canada’s commitment to routine operations, such as patrols of Canadian

⁵⁰ Figure based on Heide, “Canadian Air Operations in the New World Order,” 92. It should be noted that, as part of the AFSC project, an Enhanced Risk Assessment Model (EnRAM) was devised. It was determined from this work that the fleets were not deployed at nearly the same rate. For example, the Maritime Helicopter and Tactical Aviation fleets had the highest op tempo at nearly 50 percent while the Aurora and fighter fleets were the least operationally deployed (on expeditionary ops) with rates as low as 12 percent for the fighters (communication from LCol Marty Playford).

airspace and coastal areas, the CF and the Air Force have, at the same time, been called upon to help in a number of domestic contingency operations as well. Between 1990 and 2004 the Air Force participated in 15 domestic contingency operations, as illustrated in Figure 4.3. In 1990, concurrent with a significant commitment of air resources to the Gulf War, the Air Force was also tasked by the government to participate in the aid to the civil power operation during the Oka crisis (Operation SALON). When Spanish ships were over-fishing on the Canadian Grand Banks in 1995 the Air Force was involved in asserting Canadian sovereignty off of its coasts. In response to Manitoba's Red River floods in 1997 over 1,600 Air Force personnel and eight different aircraft types were committed to Operation ASSISTANCE. In another aid to the civil power operation, 16,000 CF personnel were involved in Operation RECUPERATION providing relief to the ice storm victims of Ontario and Quebec in 1998; a portion of these personnel came from the Air Force and over 25 Griffon helicopters and 5 Hercules aircraft were committed to this operation. Air Force support was also given to the Swissair air disaster response off the Nova Scotia coast in 1998, and in another operation the Air Force provided air surveillance and tactical transport off the Canadian east coast in 2000 during the GTS Katie affair when CF personnel boarded a foreign ship that refused to deliver CF equipment that it was carrying.

Other domestic contingency operations in this period included natural disaster relief operations such as the 1996 Saguenay River flood in Quebec, forest fire fighting in British Columbia and Alberta in 1998, and again in 2003 in British Columbia. In addition to these operations the CF and the Air Force provided security support for Vancouver's Asia-Pacific Economic Cooperation Summit of 1998, for the Organization of American States general assembly held in Windsor in 2000, for the Summit of the Americas hosted by Quebec City in 2001, and for the G8 Summit of 2002 (Operation GRIZZLY). Over 450 Air Force personnel took part in Operation GRIZZLY and 48 Griffon helicopters (half the CF helicopter fleet) flew over 600 missions in support of this operation.

The terrorist attacks of 11 September 2001 also increased the domestic contingency operations tempo: immediately after the attacks armed CF18 fighters deployed across Canada to protect Canadian air space and to prevent security threats from originating from within Canada's air space. These commitments to NORAD internal air defence operations continue today.

The number and scope of these operations created a high operational tempo for the Air Force as virtually the entire fleet of CF air platforms, including long range patrol aircraft, fighters, maritime helicopters, tactical helicopters, and airlift assets, have been used in post-Cold War routine and contingency operations both at home and abroad.⁵¹

Demands on the Air Force and its personnel have increased not only because the number and scope of CF and Air Force post-Cold War operations has increased, but also because the nature of these operations has changed as well. During the Cold War most operations were conducted from static main operating bases run by the CF, the US or Britain. If Air Force personnel worked from facilities other than a main operating base, it tended to be for a short period of time (one to four weeks) and necessary logistics support was found locally. The short length of most deployments and the fact that they tended to be on major bases with the full range of amenities and medical facilities meant that personnel with limitations on their ability to perform their duties could be often accommodated. After the end of the Cold War, the CF and the Air Force have increasingly conducted expeditionary

51 The part of this chapter on the post-Cold War CF and Air Force operations is a summary of Heide, "Canadian Air Operations in the New World Order," 77-92.

operations. This has exacerbated many of the problems encountered on operations in the “New World Disorder.”

The Nature of Expeditionary Operations. Many people today find it difficult to understand why with a paid strength of over 60,000 the CF is able to send only a few thousand people at a time, and sometimes much less than this number, on operations. This is due to the difference between today’s expeditionary operations and typical Cold War era operations. Expeditionary operations differ from the operations conducted by the CF during the Cold War in a number of ways: (1) forces are often sent to austere locations where they must provide many of the services themselves that were once provided by others at main operating bases; (2) forces are sent more frequently to dangerous locations where they must provide for their own security; (3) forces are often deployed long distances from their major sources of supply and from conventional supply lines necessitating larger and more robust supply chains; and (4) forces are frequently expected to conduct expeditionary operations over a period of months or even years as opposed to missions over a period of days or weeks during the Cold War.⁵² All these factors combined together mean that expeditionary forces require a large support component, encapsulated in the concept of the tail-to-teeth ratio.

The tail-to-teeth ratio is the number of non-combatants (tail) that it takes to keep one combatant (teeth) fighting. In modern armed forces the “tail” is significantly larger than the “teeth.”⁵³ One part of the “tail” is those who are awaiting training, in training, or those awaiting release from the armed forces. While resources must be provided to pay and look after them and they are counted toward the maximum number of personnel authorized by the government to be in the military, they are not part of its trained effective strength (TES), i.e., those members of the military who are trained and fit for operations. For example, in today’s CF with a paid strength of about 62,000, the TES is only about 53,000, or 85 percent of the force.⁵⁴ However, there are many others who are part of the TES, but are not part of the armed forces’ “teeth.”⁵⁵

In the Second World War, the Canadian Army counted only 34.2 percent of its personnel as part of the fighting arms (teeth), somewhat less than the 43.5 percent in the US Army.⁵⁶ The large number of non-combatants can be explained not only by the number of those who were not part of the TES, but also by the large number of personnel required to maintain the long supply lines from North America to Europe and the large number of specialists required to support the fighting arms (e.g., administrators, logisticians, communications specialists, equipment repair personnel, military police, medical personnel, lawyers, headquarters staff, and so on).

If anything, air forces require an even greater “tail” to support its “teeth” (the aircrew in the flying squadrons) than armies. As noted in Chapter 2, while no detailed studies have been done of Canadian air force tail-to-teeth ratios, the example of No. 83 (Composite) Group is instructive, because like the Canadian Air Force since the end of the Cold War,

52 These concepts are discussed in more detail in Allan D. English, ed., *Canadian Expeditionary Air Forces*, proceedings of the 2003 Air Symposium held at the Canadian Forces College, Bison Paper 5 (Winnipeg: Centre for Defence and Security Studies, 2004).

53 Martin van Creveld, *Supplying War: Logistics from Wallenstein to Patton* (New York: Cambridge Univ. Press, 1977). Van Creveld’s classic work examines the “nuts and bolts” of war: namely, those formidable problems of movement and supply, transportation and administration, so often mentioned — but rarely explored — by the vast majority of books on military history.

54 Stephen Thorne, “Military objectives ignore \$1.1B shortfall,” CNews (2 May 2005) cnews.canoe.ca/CNEWS/Canada/2005/05/02/pf-1022626.html. Accessed 4 May 2005.

55 For example, staff at training schools are essential to force generation, but are not part of an armed force’s “teeth.”

56 John A. English, *On Infantry* (New York: Praeger, 1984), 138-9.

it conducted expeditionary operations far from our shores. Based on the figure of 10,000 support personnel and an estimated 700 combat aircrew in its flying squadrons, it can be seen that expeditionary air forces can have a tail-to-teeth ratio of 14 to 1 compared to 7 to 1 for the British Army.⁵⁷ The air force “tail” in No. 83 (Composite) Group included the types of specialists noted above for armies, but in addition included such special units as bomb disposal, air traffic control services, photographic reconnaissance, aviation fuel specialists, casualty air evacuation, mobile radar, and specialist aircraft servicing detachments.⁵⁸

The dramatic increase in the number of expeditionary contingency operations being conducted by the CF during the post-Cold War period requires that it now have support elements that are more responsive and deployable than those of the Cold War era. The implications for Canada’s Air Force of this new operational environment have been profound. During the Cold War, except during exercises or times of heightened tension, most Air Force operations were conducted from main operating bases and they followed a work cycle not unlike those in the civil aviation industry with reasonably predictable working conditions and with personnel living in Canada or at Canadian bases in Europe with all the necessary amenities. Since the end of the Cold War, Air Force operations have been conducted in conditions much closer to those experienced by the members of 83 Group in the Second World War than by the Cold warriors. Expeditionary air force operations require personnel to deploy for up to six months at a time to remote parts of the world and to work from austere facilities. In many cases, the Air Force, which used to rely on its own or allied main operating base support, must now provide its own support, including aircraft servicing support, communications, administration, and medical support along the lines of those provided by 83 Group. Air force expeditionary forces are also liable to provide aspects of their own security and force protection, using both integral military police resources and often already over-tasked air force technicians doing this security work as a secondary duty. Furthermore, to ensure a quick reaction to natural disasters or military missions, Air Force personnel must be identified, screened (for physical and emotional fitness), and fully trained and equipped (individually and as sub-units) for expeditionary operations.⁵⁹

The RCAF’s experience with high intensity expeditionary operations in the Second World War, as described in Chapter 2, has some lessons for today’s Air Force which is also involved in large scale (given the size of today’s Air Force) high intensity expeditionary operations for the first time since the Second World War. The RCAF was successful in conducting these operations because, for one of the few times in our history, it had the resources necessary to conduct them. Critical to the RCAF’s success in raising and sustaining expeditionary forces was its large pool of personnel. This gave the RCAF the necessary flexibility to cope with attrition due to casualties and other personnel losses such as injury and sickness, plus the flexibility to deal with unanticipated missions. Another factor that worked in the RCAF’s favour was that the vast majority of its personnel were engaged for “hostilities only” service, which meant that it did not have to sustain this force’s viability over a long period of time.⁶⁰

57 The figure for the British Army is from John A. English, *On Infantry*, 139.

58 See Brereton Greenhous, et al., *The Official History of the Royal Canadian Air Force. Vol. 3: The Crucible of War 1939-1945* (Toronto: Univ. of Toronto Press, 1994), 259, 269, 273, 308, 310 for a more complete description of 83 Group’s organization. See also Howard Coombs, “Supporting Canadian Aerospace Expeditionary Forces,” in Allan D. English, ed., *Canadian Expeditionary Air Forces*, 83-92, for a discussion of these issues in a post-Cold War context.

59 Heide, “Canadian Air Operations in the New World Order,” 83-4.

60 For a detailed discussion of the RCAF’s personnel management system see Allan D. English, *The Cream of the Crop: Canadian Aircrew 1939-1945* (Montreal and Kingston: McGill-Queen’s Univ. Press, 1996).

Unlike Canada's armed forces and the RCAF in the Second World War, the CF and the Air Force today have two significant challenges in carrying out their roles and missions: (1) a declining personnel and resource base with increasing commitments, and (2) a responsibility to sustain their forces over the long term, i.e., indefinitely. In order to meet these challenges the CF and the Air Force, like other Western armed forces, have devised personnel policies to give their members time to recover from operations, to take career and professional development courses, and to allow them to fill a training or a staff position before entering a period of training to prepare for operations again. These policies are based on a professional development model that allows time for professional courses, self-development, and experience in various jobs, like staff and training positions, as well as experience on operations. While it is tempting to some to cut back on professional development and training during periods of high operational tempo, this practice sacrifices the long term sustainability of the force for the short term achievement of operational missions.

In a crisis such as the post-9/11 "War on Terror" a focus on the short term can be justified and managed using a **crisis personnel employment cycle** with these phases: (1) operations—six months, (2) rest—several weeks or months as required depending on the severity of operations, and (3) prepare for operations—several weeks or months depending on complexity of the mission. This cycle is based on a **2:1 ratio of personnel at home to personnel on operations** and can be maintained for a short period of time. However, the high toll that this cycle takes on personnel leads to the degradation of the force in a relatively short period of time (several years) through casualties, burnout, and voluntary attrition. Furthermore, this model allows no time for the education and training of members of the force necessary to maintain the professional expertise of its members and to allow them to maintain the professional competencies required to meet the challenges of a complex and changing world.

To mitigate the negative effects of the crisis personnel employment cycle and to allow for some medium-term force sustainability, when necessary, a **high operational tempo personnel employment cycle** can be used. It consists of these phases: (1) operations—six months, (2) rest—several weeks or months as required depending on the severity of operations, (3) professional development and/or non-operations job one to three years, (4) prepare for operations—several weeks or months depending on complexity of the mission. This cycle is based on a **3:1 ratio of personnel at home to personnel on operations**. However, this cycle, if used for long periods of time (several years), can cause a great deal of stress on both the organization and on individuals, leading to attrition rates that threaten the long-term sustainability of the force. This cycle has had a particularly damaging effect on the ability of Air Force personnel to maintain their skills because expeditionary deployment cycles are very long, typically approaching 12 months when all pre-deployment preparation and post-deployment activities are factored in. Therefore, personnel are often unable to complete all the training and education required to acquire the skills necessary for career progression, nor are they able to retain all of their required skills because while on operations not all necessary skills are practiced.⁶¹ For example, some air transport personnel, both aircrew and groundcrew, are required to maintain skills necessary to conduct tactical air delivery (parachute) operations. However, if at the end of a six-month deployment the skills associated with tactical air delivery (parachute) operations have not been used, they will have degraded to the point where the personnel can no longer conduct these operations.

An armed force that must sustain itself at a certain size and level of readiness indefinitely needs to adopt a **long-term personnel sustainability employment cycle** similar to this

61 Heide, "Canadian Air Operations in the New World Order," 84.

one: (1) operations—six months, (2) rest—several weeks or months as required depending on the severity of operations, (3) professional development and/or non-operations job—one to three years, (4) professional development and/or non-operations job—one to three years (5) prepare for operations—several weeks or months depending on complexity of the mission. This cycle is based on a **4:1 ratio of personnel at home to personnel on operations**. This type of cycle is necessary for professional militaries to maintain their long-term viability because of the need for extensive training and education of their personnel, the need for large staffs to procure and carry out life-cycle management of high technology equipment, as well the need for large numbers of personnel to fill staff, training and other non-operations jobs. Note that the ratios given here are for illustrative purposes only, and could be much higher if multi-year postings or extended training is required.

It is important to note that for all of the cycles to work as described it is assumed that most personnel are fit and able to be employed in all parts of the cycle (i.e., the TES represents a very high percentage of the entire force). Personnel who are not fit to go on operations and who can only do non-operations jobs merely transfer the stress of serving on operations on to those who are fit to deploy with the concomitant harmful effects on the long-term sustainability of the force.⁶² Significant numbers of unfit personnel held on strength could turn what appears to be a long-term personnel sustainability employment cycle into a high operational tempo personnel employment cycle or even a crisis personnel employment cycle. Recent studies have shown that, despite the efforts of the Air Force to use a personnel employment cycle with better prospects for the long-term sustainability of the force, attrition rates for Air Force personnel are forecast to double over the next five years and not stabilize at lower levels until at least 2012. This attrition problem could have a severe impact on the Air Force's ability to carry out its roles and missions in the short term let alone sustain itself in the long term.⁶³

For much of the period since the end of the Cold War, for the reasons described above, the CF has been forced to use a **high operational tempo personnel employment cycle** with about one third of its deployable force “preparing for, engaged in or returning from an overseas mission.”⁶⁴ This high operational tempo combined with a lack of personnel and financial resources has led to a situation where the CF is unable to sustain its ability to carry out its roles and missions in the long term. These problems were summarized in testimony before the Senate in February 2005 by the CAS of the day, LGen Pennie: “The air force is at a critical time in its evolution...we have one-half of the number of people and one-half of the number of aircraft that we had at the end of the Cold War. Over the same period, the number of air force personnel deployed on operations has roughly doubled with no sign that future operational tempo will decrease. Currently, aging fleets and infrastructure impose further strains on the air force's ability to fulfil its roles. The gap between national procurement funding and the need, and the diminishing experience levels of, and the ability to retain our personnel exacerbate these existing problems. In short, the air force faces a sustainability gap in its ability to generate operational capability as it transforms to fulfill

62 The concepts related to the personnel sustainability employment cycle have been developed by Allan English as part of the curriculum of the Advanced Military Studies Course which he has taught at the Canadian Forces College as an academic over the past seven years. The principal sources for these concepts are at “AMSC Bibliography: Sustainment: a Select Bibliography” at wps.cfc.forces.gc.ca/bibliographies/177_en_sustainment.htm. Accessed 1 Dec 2006.

63 DND, *The Aerospace Capability Framework*, 47.

64 DND “DND, Operations, Current Operations,” www.forces.gc.ca/site/operations/current_ops_e.asp. Accessed 4 May 2005.

its roles in defence of Canada and Canadian interests.”⁶⁵ These problems, particularly those related to personnel tempo are especially acute for support trades since, as noted above, Air Force support personnel have deployed in support of most Army and many Navy contingency operations where no Air Force operational assets were deployed.

The Air Force Support Capability – A Solution to Air Force Support Problems? The problems associated with the personnel sustainability employment cycle in the post-Cold War era, described above, first became apparent in the Air Force to members of its support community due to the nature of support to expeditionary operations. These problems were exacerbated by a lack of understanding of these problems among many Air Force leaders and the lack of doctrinal guidance to deal with these problems. This section of the chapter deals with issues surrounding air force support in current operations.

Air force support operations (also referred to as ground operations), encompass all the non-flying activities which are required to generate and sustain air operations. Support operations comprise two distinct activities—operations support and logistics support. In developing and maintaining aerospace forces, an appropriate balance must be achieved between acquiring operational forces and providing the requisite level of support capability. Air force experience during the 1991 Gulf War, and operational evaluations of the era, highlighted deficiencies in the provision of ground support personnel and equipment for deployed operations, as it was found that availability of support personnel and equipment was not predetermined beyond simple numerical accounting and that support capabilities were generated by creating ad-hoc organizations.

To address these problems, better utilize scarce resources, and overcome command and control limitations, the air force developed a concept for the support of deployed operations called the Contingency Capability (C Cap). C Cap was intended to provide an integrated structure for the management and coordination of units and personnel supporting deployed air force operations. This concept included establishing, equipping and training units and personnel to meet specified operational readiness requirements, as well as tasking them to deploy, operate and survive wherever their services were required. C Cap units were to be available for world-wide deployment to support the full spectrum of air force missions.⁶⁶

To provide the deployable support capability, four C Cap shadow squadrons were to be formed at three of the largest Air Command wings: Cold Lake, Trenton and Greenwood. At these locations, a C Cap headquarters would be established to control the four C Cap squadrons: Air Combat Service Support (ACSS), comprising Logistics, Finance and Personnel support services; Airfield Engineering (AE); Airfield Security Force (ASF); and Telecommunications and Information Services (TIS). Each of the squadrons was in turn made up of flights, which were drawn from all Air Force wings in the geographical area of each C Cap headquarters. A Contingency Capability Centre (CCC) was established at Trenton, with responsibility for training and readiness levels of the new C Cap units and personnel.

Only a few of the C Cap squadrons had a limited number of full-time personnel assigned, with the majority of C Cap positions existing only within “shadow” establishments, nominally identified within each wing’s support organization. It was intended that personnel

65 LGen Ken Pennie, Chief of Air Staff, testimony before the Standing Senate Committee on National Security and Defence, Proceedings of the Standing Senate Committee on National Security and Defence Issue 11 - Evidence, 7 February 2005, available at www.parl.gc.ca/38/1/parlbus/commbus/senate/Com-e/defe-e/11eva-e.htm?Language=E&Parl=38&Ses=1&comm_id=76. Accessed 29 Nov 2006.

66 Canada, Air Command, “Contingency Capability: Concept of Operations” (Winnipeg: Air Command Headquarters, 1997), 6.

would be assigned to the C Cap squadrons or sub-units for pre-deployment training and for the duration of specific operational deployments. The C Cap squadron headquarters and personnel assigned to the C Cap squadrons remained under command of their respective wing commander; however, when deployed the C Cap squadrons were to be placed under operational control of the deployed air component commander.

The C Cap concept was introduced in 1997, but experienced only limited success. Although specific C Cap squadron positions had been formally identified on wings across Canada through “shadow” organizations, the positions went largely unfilled or were the first to be deleted in the ongoing personnel reductions. Problems in tasking personnel occurred as a result of lateral command and control conflicts between the three main “regional” wings and the remaining “feeder” wings. For example, there was disagreement in determining the priority allocated to deployed operations, the focus of the CCC, versus the priority allocated to day-to-day operations conducted at the main operating base, the focus of the “feeder” wings. It also became apparent that the initial C Cap concept of operations was based on worst-case scenarios requiring large support forces; however, the majority of deployed air force operations required much smaller capability elements or sub-elements.⁶⁷

In view of the magnitude and complexity of the problems, an Air Force Support Capability (AFSC) project was initiated in 2000, with a mandate to review the C Cap concept, determine the baseline air force support requirements, and develop a structure to provide the necessary support resources. Initially the scope included all support functional areas but was reduced to AE, Logistics and CIS within the first six months of the project. The AFSC project team identified a number of deficiencies with the provision of support forces for expeditionary operations. Foremost among these were the lack of deployable equipment and the air force practice of force generating its deployable support forces in an ad hoc manner from multiple sources. This ad hoc force generation process inhibited the ability to train support personnel collectively because deploying elements were not co-located. The ad hoc structures also tended to complicate command and control because the organizational structures differed from mission to mission and subordinate commanders and personnel did not know their commanders until they arrived in theatre. The lack of deployable equipment also reduced readiness levels and support capabilities.

The AFSC team identified a number of guiding principles to be incorporated in a new support concept. It was considered essential to avoid generating expeditionary support forces from across the country in an ad hoc manner, thereby providing personnel only a few weeks training together before deploying them. The concept would thus need to ensure that support forces were organized as formed elements and trained and equipped to a common standard that was consistent with CF direction. By deploying formed units from one location, both operators and supporters, the Air Force could also ensure that the existing family support systems were used effectively, which would in turn enhance follow-up monitoring for post-deployment stress. It was also considered important that the new concept should enhance the individual member’s quality of life by offering predictable training and deployments. A total force approach, integrating and employing Reservists as part of the capability was also considered essential. As operations would continue at a main operating base after some forces deployed, the new concept would also need to ensure the Air Force was able to support both main operating base and deployed operations concurrently.⁶⁸

67 Canada, 1 Canadian Air Division, “Contingency Support Capability: Concept of Operations” (Winnipeg: 1 Canadian Air Division Headquarters, 2000), 1. Note: some involved in the AFSC project dispute the statement in the last sentence above, but, for now, there is no documentary evidence to support a contrary position to the one expressed in that sentence.

68 “Air Force Support Concept (AFSC), Brief to Armed Forces Council,” 1 March 2002.

The AFSC team therefore developed a new Air Force Support Concept, which incorporated these principles and addressed the deficiencies in the original C Cap concept. Under the new AFSC concept, the Air Force would establish Mission Support Units (MSUs) at four primary mounting wings: 4 Wing Cold Lake, 8 Wing Trenton, 3 Wing Bagotville and 14 Wing Greenwood. (These were subsequently expanded to include 17 Wing Winnipeg and 19 Wing Comox.) These MSUs would be formed units with trained and ready-to-deploy elements (Mission Support Squadrons) of air operations support personnel, who could be deployed to meet published notice to move requirements. The AFSC MSU structure would encompass four functional areas: Logistics (Log), Airfield Engineering (AE), Communications and Information Services (CIS), with Military Policing (MP) included later in the project to address force protection requirements.

The Log, AE and CIS support forces would be concentrated in formed deployable units at the primary mounting wings, and aligned by Fighter, Maritime Patrol, Air Mobility and Tactical Aviation (helicopter support to the Army) warfare communities. Support at the remaining Air Force wings would be provided by a mixture of military, DND-civilian, and contractor personnel. MP forces would remain in their current structure and locations on all wings to provide the uniformed policing services required. All wings would have Military Wing Support Teams to provide the military liaison between the operators and the service providers.

The new AFSC concept is consistent with the current CF Concept of Employment,⁶⁹ which emphasizes development and employment of Tactically Self-Sufficient Units (TSSUs).⁷⁰ In the AFSC construct, there are two Air Force TSSUs in an Air Expeditionary Unit (AEU). The first TSSU is a functional aerospace capability (normally a certain number of aircraft and aircrews) with its maintenance, command and control (including intelligence), and integral support elements (usually one or two supply techs). The second TSSU is a Mission Support Squadron (MSS), which is the deployed element of an MSU, including Log, AE, CIS, and MP elements, and which provides support to the AEU at a deployed operating base. An AFSC MSS could support several aerospace capability TSSUs at the same site if necessary.

In February 2002, Armed Forces Council recognized the AFSC project as the way ahead for the Air Force to align with national support initiatives and to meet Defence Plan Guidance for interoperability with joint and allied forces. The Minister of National Defence endorsed the AFSC in 2003. A proof of concept to validate much of the AFSC structure and equipment is planned to be conducted in the Spring of 2006 in conjunction with Exercise Maple Flag at 4 Wing Cold Lake.⁷¹

A comprehensive and overdue undertaking, the development of the AFSC has been hampered by a dearth of doctrine and policy guidance, both on air force expeditionary operations and on support operations. The most recent, although now cancelled without a replacement, aerospace doctrine manual (B-GA-400 *Out of the Sun*) includes no reference to expeditionary operations, while the companion support doctrine manual (B-GA-410 *Support to Aerospace Doctrine*) has never been promulgated. In the absence of these basic documents, the Air Force Transformation project established the composition of Air

69 For further details, see: DND, *Capability Based Planning for DND and CF*, Chapter 3 – CF Concept of Employment, available at: www.vcds.forces.gc.ca/dgsp/00native/rep-pub/cbpmanual_e.pdf. Accessed 29 Nov 2006.

70 TSSUs are the fundamental assets that the CF requires for international operations, and they are also key contributors to fulfilling domestic responsibilities. TSSUs must be capable of integrating into a Joint/Combined Force package as a “task-tailored” component, and accordingly must be modular and adaptable, capable of integrating with other international and national forces that are likely to be involved in a joint and/or combined operation. DND, *Capability Based Planning*, 14.

71 Canada, 1 Canadian Air Division, “Air Force Support Capability, Concept of Operations,” (Winnipeg: 1 Cdn Air Div HQ, 2005).

Expeditionary Units for each of the operational communities. As this activity was under way, the AFSC team continued to develop the support capability for expeditionary air support to be optimized. The creation of dedicated MSUs and the deployment of MSSs as integral components of AEUs appears an appropriate approach, and is aligned with concepts presented in the recently promulgated Air Force vision document, *Strategic Vectors*.

Expeditionary air operations figure prominently in *Strategic Vectors*.⁷² Vector Two—Responsive Expeditionary Capability indicates that: “The Air Force will create Tactical Self Sufficient Units of aerospace capability, called Air Expeditionary Units. These units will be designed with integral military air maintenance, command, control and support elements. Our Air Force Support Capability has been re-designed and is fully aligned with this revised operational force structure.” However, the lack of doctrine and policy guidance, will need to be resolved if the Air Force is to successfully meet the challenge of expeditionary operations.

As we have seen, another key issue that must be resolved by the Air Force to meet the challenge of expeditionary operations in the 21st century is the necessity of generating adequate numbers of qualified personnel to maintain a long-term personnel sustainability employment cycle. Shortages in qualified Regular Force personnel to fully staff post-Cold War CF operations have resulted in a reliance on the Reserves to meet operational taskings, and, therefore as with the AFSC project any Air Force revised force structure must be “Total-Force,” with a significant contribution from the Air Reserve.

The Air Reserve and the Total Force Concept. The Total Force concept recognizes that Canada’s total military capability comprises both the full-time Regular military plus the part-time Reserves. The Total Force concept does not in itself justify a role or roles for any particular defence component,⁷³ but it does recognize that all components, whatever their structure or size, must be considered when developing defence capabilities. The “Total Force Concept” was formally instituted by the Minister of National Defence in March 1974. National Defence Headquarters subsequently promulgated Directive D29, which included direction on the expansion of the Air Reserve including “twinning” of squadrons, the introduction of new aircraft, the formation of a new Air Reserve squadron, the creation of Air Reserve Augmentation Flights and changes to the command and control of the Air Reserve.⁷⁴

Under the “twinning” concept, Air Reserve units were paired with Regular Force units, primarily to give them access to the equipment of Regular Force units. This pairing enhanced the Air Reserve’s ability to augment Regular Force units and eliminated the need to purchase additional equipment for the Reserves. In Edmonton 418 Squadron shared Twin Otters with 440 Squadron and in Winnipeg 402 Squadron was twinned with the Air Navigation School flying the C47 Dakota. In May 1975, 420 Squadron was resurrected at Shearwater, subsequently moving to Summerside to share 880 Squadron’s Trackers for coastal patrol duties. Another Total Force concept, the Air Reserve Augmentation Flight, was initiated in Moose Jaw in 1975, and then expanded to all Air Command bases.⁷⁵

72 DND, *Strategic Vectors*, 2. The “Foreword” signed by CAS states that: “Strategic Vectors outlines our vision for the future, to transform the Air Force from a primarily static, platform-focussed air force to an expeditionary, network-enabled, capability based and results-focussed aerospace force for the 21st Century.”

73 The components of the Canadian Forces are: (a) the Regular Force; (b) Reserve Force; and (c) when established, the Special Force. DND, *Queen’s Regulations and Orders for the Canadian Forces, Volume 1*, art 2.0.1 available at: www.admfincs.forces.gc.ca/qr_o/vol1/intro_e.asp. Accessed 1 Dec 2006.

74 DND, Director Air Reserve, “Air Reserve Development Strategy” (draft dated 16 Sep 2004), 10.

75 DND, Air Reserve History, Post-Integration, www.airforce.forces.ca/air_reserve/history/post_integration_e.asp. Accessed 26 Nov 2005.

When Air Command was first established, control of the Air Reserve was exercised directly from Air Command Headquarters, through the office of the DCOS Reserves and Cadets. In recognition of the increased emphasis on Reserves in the Total Force structure of Air Command, as described above, an Air Reserve Group was created in 1976, with headquarters at Winnipeg. Air Reserve Group Headquarters exercised administrative control of some 950 Air Reserve personnel; however, operational control of units was vested in the commanders of operational air groups to which reserve squadrons were assigned.

To further enhance the operational capability of the Air Reserve, Air Command retired the venerable Otter aircraft, flown by a number of Reserve squadrons, in 1981 and introduced the Kiowa helicopter into the Reserve squadrons of 1 Wing in Montreal and 2 Wing in Toronto. After the retirement of the Otter, the two wings operated equipment compatible with the Regular Force squadrons, and gained an operationally active role in support of Canada's ground forces. On the support side, Nos. 1 and 2 Tactical Aviation Support Squadrons (TASS) were formed in 1987. These squadrons were composed of one third Regular and two thirds Reserve Force personnel. Their role was to provide aircraft maintenance and logistical support to the squadrons of 1 and 2 Wings; however, they also provided similar services to Regular Force units and to various operations in Canada and Germany.

The new Canadian Defence policy promulgated in 1987 continued to emphasize the Total Force concept, with the Reserve viewed as part of the solution in closing the "commitments-capabilities gap" identified in the White Paper. At the time of the 1987 Defence Policy, the establishment of the Air Force comprised 23,050 Regular Force positions and 950 Reserve positions. In an effort to increase operational capability, while limiting the increase in personnel costs, most of the growth planned to redress the commitments-capabilities gap was planned to occur in the reserves. However, with the post-Cold War changes to defence priorities, personnel reductions were seen as desirable and possible as a result of the "peace-dividend" and plans for growth were shelved.

In response to the 1994 White Paper, the Commander of Air Command sought to strengthen the Reserve contribution to the Total Force Air Force, and directed his staff to plan to increase the Air Reserve to 3,000 personnel by FY 1999/2000. As part of the increased emphasis on Total Force, the Commander also directed that Air Reserve and Regular Force personnel be fully integrated into Total Force units and that there be a single chain of command. This was to be accomplished through amalgamation of the Air Reserve Group Headquarters into the Air Command Headquarters and by converting "all Air Command units to Total Force units with regular and reserve personnel serving together in integrated establishments."⁷⁶

In implementing this direction, three Reserve flying squadrons (Nos. 401, 411 and 418) were disbanded between 1994 and 1996, while No. 420 was "zero-manned" (remaining on the establishment but with no personnel or aircraft assigned to it). In 1996, Nos. 1 and 2 TASS and No. 2 Wing were also disbanded and 1 Wing was restructured as a Total Force wing. Of the six helicopter squadrons belonging to 1 Wing, two (Nos. 400 and 438) were designated "reserve heavy," and all squadrons received new Griffon helicopters to support army operations. Air Reserve Group Headquarters was disbanded in 1996 and control of the Air Reserve returned to Air Command Headquarters, with responsibility subsequently divided between the Air Staff in Ottawa and 1 Cdn Air Div HQ in Winnipeg.

By 1997 it had become evident that the development of the integrated "Total Force" Air Command establishments had been started, but had not been completed or fully

76 DND, "Air Reserve Development Strategy," 11.

implemented. 1 Cdn Air Div HQ also expressed concern with the establishments in those units that had been created, noting that, “Air Reserve positions, especially within the Air Reserve Augmentation Flight (ARAF) context, have been informally regulated and in many instances are seen primarily as ‘office overload.’ Frequently positions are changed to suit the availability of certain individuals or skill sets, rather than to a defined role or mission.”⁷⁷

To correct this deficiency, the Headquarters directed that a comprehensive establishment review be undertaken and that appropriate Total Force establishments be created. The integrated establishments were to provide the basis for Air Reserve growth plans and for the development and authorization of an Air Reserve occupational structure. The review was to be conducted by individual units and integrated across the Air Force, employing a bottom-up approach. The Chief of the Air Staff approved the Air Reserve establishment review in 1998, noting that the bottom-up development of the establishment was an important first step, but that it would be subject to Air Staff review as the overall strategic direction for the Air Force evolved.

The mission and roles of the Air Reserves have been studied several times since 1995. These studies have formulated and validated numerous principles for the employment of Air Reservists and provided a number of recommendations for the optimal integration of the Air Reserve into the Total Force structure. However, these recommendations have not been formally validated against the evolving Aerospace Capability Framework, nor have Total Force establishments been created within a comprehensive development plan. To address these issues, the Air Reserve Development Project was chartered in April 2002 to identify a force structure that would optimize the contribution of the Air Reserve within the Total Force structure of Air Command. This project is ongoing and it recognizes that the conduct of expeditionary operations must be an essential element of any Total Force structure.

Conclusions

Air Command was formed in 1975 with the objective of bringing all CF air element resources under a single commander to address the problem of the disjointed command and control of the CF air element, as well as the lack of a central focus for all air operations and doctrine. The organizing principle originally adopted by Air Command was similar to the one used by the RCAF, and many other air forces, and was based on a command structure organized by air force functions, (e.g., air defence, air transport, maritime air, etc.). Therefore, the new Command adopted an organizational structure comprised of a command headquarters, with subordinate functional air groups. This structure minimized headquarters resources, and facilitated the transfer of operational control of group forces to user commands. The major anomaly in this command structure was the base commander position which was designed to oversee administrative support to air force units at main operating bases, but was not consistent with the principle of functionality and was outside the operational chain of command.

From 1975 to 1989 Air Command enjoyed a period of relative stability, but change in the defence and security environment, beginning with détente and the end of the Cold War, necessitated a revised defence policy. Major reductions in Air Command’s establishment, force structure and operating budget in the post-1990 timeframe, in anticipation of a post-Cold war “peace dividend,” signalled an end to this stability. In an attempt to mitigate the impact of budgetary constraints and cuts in personnel and equipment due to the anticipated “peace dividend,” Air Command undertook a number of reorganization initiatives. The

⁷⁷ DND, “Air Reserve Development Strategy,” 12.

first occurred in 1993, and centred on implementation of the “wing” concept throughout the Command. This was accomplished by superimposing a “wing” structure on all existing bases, and appointing (double-hatting) the base commander as wing commander as well. This reorganization established the base commander in the operational chain of command, but also introduced an additional level of command and control. The wing concept enhanced the control of resources at the static base, but provided little improvement in mounting and sustaining expeditionary operations.

The MCCRT, beginning in 1997, drove the most significant restructuring of the CF and the Air Force in the post-Cold War period, in compliance with 1994 White Paper direction that headquarters be reduced by at least 33 percent. The AFCCRT, a team formed by the Air Force in response to the MCCRT, designed a “streamlined” command structure, which saw the disbandment of the four functional groups and the elimination of their headquarters, as well as Air Command Headquarters in Winnipeg. The new command structure was based on a strategic-level Air Staff component in NDHQ (with the CAS appointed Commander Air Command) and an operational-level headquarters—1 Cdn Air Div Headquarters in Winnipeg. The wings and units were unaffected by this reorganization, but in the new headquarters construct there was little recognition of air force functions; therefore, compensatory capability frameworks and capability advisory groups were established to address functional issues.

While all these organizational changes were under way, significant changes were occurring in the way the CF and the Air Force conducted operations in the “new world disorder.” Expeditionary operations began to place significant new demands on the forces and the personnel deployed on these types of operations, requiring them to be more robust than the forces of the Cold War era. Expeditionary forces are expected to conduct operations over longer periods of time than Cold War forces and frequently to conduct these operations from austere operating bases located in dangerous locations far from their major sources of supply. Therefore, expeditionary forces must be composed of fit, properly trained personnel, and these forces need to be supported by logistics and administrative components much larger than the Cold War forces that worked from well-equipped main operating bases. Furthermore, air forces require a higher degree of technical support than land forces. This explains why expeditionary air forces need a tail-to-tooth ratio significantly larger than most other military forces.

At the same time that the government was tasking the CF more heavily, it was making significant cuts to the CF’s personnel strength and budget allocation. In the post-Cold War period, while the CF’s resources (budget and its personnel strength) were cut by about 20 percent, the number of its personnel deployed on operations increased threefold. This organizational and personnel stress has had severe negative impacts on the CF in general and the Air Force in particular. In the 1990s, when the CF was reduced by about 20 percent of its Regular Force military personnel, the Air Force was reduced by 48 percent. The cumulative effects of all these factors have diminished the Air Force’s capability to the point where it can no longer maintain the current tempo of operations let alone sustain the long-term health of the force.

Throughout the 30 years covered by this chapter, there have been systemic problems that have impeded Air Force change efforts resulting in ad hoc responses to change requirements. Many of these ad hoc change processes were symptomatic to the CF as a whole in this period, and included the lack of an effective lessons learned capability, reduced CF capabilities, and high operational tempo. The sum of these problems, plus chronic problems with the Air

Force change process, has hindered the Air Force's ability to deal effectively with recent challenges. For example, post-Cold War Air Force organizational structures have shown little evidence of addressing command and control issues created by the increased emphasis on expeditionary operations or of implementing the new CF Concept of Employment based on TSSUs. However, Air Command recognized deficiencies in providing appropriate support forces to sustain expeditionary operations, and changes to the posture of air force support capabilities were initiated. These included the initial development of the Contingency Capability and subsequently the development of the Air Force Support Concept. But progress in this area has been hampered by the dearth of appropriate doctrine and by the absence of any policy guidance on expeditionary operations.

While the recently released Air Force vision document, *Strategic Vectors*, identifies expeditionary capability as one of the components of its transformation goals, the strategy and the detailed plan for achieving this "expeditionary" vision have yet to be provided. This has led to a situation where a significant number of Air Force personnel who had been involved in recent expeditionary operations perceived that there was a lack of effective leadership in some parts of the Air Force. This issue will be discussed in more detail in the next chapter.

Throughout the period described in this chapter, the lack of coherent Air Force doctrine above the tactical level, particularly doctrine related to command and control, has led to a series of ad hoc, expedient changes to the structure of Canada's air forces. In this era, without any overarching model of command and control, a detailed understanding of historical models of air force command and control, or the ability to consistently apply modern theories of command and control, the Canadian air force was burdened with disjointed, often dysfunctional, C² arrangements whose legacy continues to plague the Canadian Air Force to this day.

Chapter 5

Air Force Leadership: An Overview and Canadian Perspectives

Context

Two recent DRDC reports have highlighted serious problems with Canadian Air Force leadership. The latest report (September 2004) was an Air Force Deployment Reintegration Research study. Based on data gathered from members of the Air Force who had deployed on operations and had returned to Canada, it concluded that Air Force personnel perceived that there was “a profound lack of effective leadership” in some parts of the Air Force. Among other things, lack of group cohesion, lack of teamwork, and lack of recognition were cited by these personnel as important leadership issues.¹

This profound lack of effective leadership in some parts of the Air Force should come as no surprise to those who had read another DRDC study which was written earlier that year and which concluded that there were fundamental problems with Air Force leadership development. This first study attributed most of these problems to the lack of both an integrated Canadian Forces and an integrated Air Force training and education system. This situation has resulted in a lack of coherence and focus in Air Force leadership education and training.² Both reports highlighted the need for better Air Force leadership training and education, particularly related to working in teams composed of members from many military occupations or specialties as well as teams consisting of the various CF Environments (Army, Navy and Air Force).

CF doctrine recognizes environmental differences in leadership based on “distinct and unique bodies of knowledge” that are required to conduct operations in the distinctly different physical environments of land, sea and air.³ The “defining document for Canada’s profession of arms,”⁴ *Duty with Honour*, puts it this way:

...all CF members must master the art of warfare in their own medium if they are to become true professionals in the joint, combined and inter-agency context that characterizes modern conflict. Expertise must be distributed according to the harsh demands of this environment, and the military ethos must accommodate the separate identities forged by combat at sea, on land and in the air.⁵

However, a key aspect of the art of air warfare, leadership, has not been carefully studied in a Canadian context. This is a serious obstacle to mastering the profession of arms in the Canadian Air Force. Although a bibliography of sources on Canadian Air Force leadership, such as the one that is provided at the end of this book, may seem large, relatively few

1 Wendy Sullivan-Kwantes, Angela R. Febbraro, and Ann-Renee Blais, “Air Force Deployment Reintegration Research: Implications for Leadership,” Defence R&D Canada – Toronto, Technical Report TR 2004-149 (27 September 2004), iii.

2 Allan English, “Survey of Current Leader Development in the Air Force” for Defence Research and Development Canada, 17 March 2004. It should also be noted that the current lack of staff dedicated to leadership in PME is also a contributing factor to current Air Force leadership problems. For example, when 14 Training Group was created in 1981 it included a Leadership Training cell comprising a major and two captains. When 14 Training Group was subsequently disbanded, these positions disappeared.

3 Canada, Department of National Defence (DND), *Duty with Honour* (Kingston, ON: Canadian Defence Academy, 2003), 19, 25, 59.

4 *Ibid.*, 1.

5 *Ibid.*, 74.

works specifically analyze and examine Canadian Air Force leadership in a rigorous manner based on both experience and theory. Yet we are not alone in this state of affairs.

Gimblett has noted in his review of the naval leadership and command that the critical literature is “astonishingly sparse.”⁶ Likewise the literature on air force leadership of our principal allies is largely prescriptive and descriptive, and lacks the analytical focus, based on a coherent and overarching approach, that is now appearing in the CF leadership and command literature. For example, the most recent analysis of US Air Force leadership training and education concluded that there was an “absence of fundamental truths based upon rigorous research of what it means to lead airmen” in US Air Force Professional Military Education institutions. The author of this analysis observed that “our schools formally present most service members with academic models having no basis in Air Force experience and informally talk to them about Air Force stories. Sometimes the models support the stories; other times they do not. Many times the stories conflict with each other. At the end of the day, the service member must bridge the intellectual gap.”⁷ A number of commentators have also noted the lack of US Air Force leadership doctrine.⁸ This lack was only partially remedied with the publication of *Leadership and Force Development* (AFDD 1-1) in February 2004, because this doctrine document is focussed primarily on force development and only eleven pages are given over to a fairly cursory examination of US Air Force leadership and the US Air Force as a profession.⁹ Royal Air Force and Royal Australian Air Force doctrine have even smaller sections in their major doctrine manuals that discuss leadership.¹⁰ This is far short of the two CF publications that address leadership and the profession of arms—*Conceptual Foundations* (144 pages) and *Duty with Honour* (82 pages). Admittedly, these publications are about CF, not Canadian Air Force, leadership and professionalism; however, they provide a much more extensive doctrinal foundation for these subjects than the air forces of our major partners. With these two CF publications plus the work of Pigeau and McCann on the human dimension of command, Canada is at the forefront of those producing leadership theories and doctrine that can be used for the rigorous analysis of operational experience.

As with the USAF in the example cited above, the Canadian Air Force has a number of problems with PME that impact on leadership and command in the Air Force. The first is that, in the absence of up-to-date CF aerospace doctrine, the Canadian Forces College (CFC) decreed that senior officer PME at CFC would rely on foreign aerospace doctrine. A September 2005 CFC curriculum note stated that: “As of this year, [the] CAS [Chief of the Air Staff] has discarded *Out of the Sun* as restrictive and inadequate. New doctrine is to be drafted in the coming years by the new Air Warfare Centre. In lieu of Canadian-sanctioned

6 Richard H. Gimblett, “Canadian Naval Command Styles,” in Allan English, ed., *Leadership and Command and the Operational Art* (Kingston, ON: Canadian Defence Academy Press, in press). See Allan English, Richard Gimblett, Lynn Mason and Mervyn Berridge Sills, “Command Styles in the Canadian Navy,” Defence Research and Development (DRDC) – Toronto, Contract Report CR 2005-096, (31 January 2005) for more details on naval command and leadership.

7 Mike Thirtle, “Toward Defining Air Force Leadership,” *Air and Space Power Journal* 16, no. 4 (Winter 2002), 9-16. Quotes from internet version, np. www.airpower.maxwell.af.mil/airchronicles/apj/apj02/win02/vorwin02.html. Accessed 29 Nov 2006.

8 Shannon A. Brown, “The Sources of Leadership Doctrine in the Air Force,” *Air and Space Power Journal* 16, no. 4 (Winter 2002), 37-45.

9 See US Air Force, *Leadership and Force Development* (AFDD 1-1) dated 18 February 2004, www.dtic.mil/doctrine/jel/service_pubs/afdd1_1.pdf. Accessed 29 Nov 2006. Note that the USAF defines “force development as a series of experiences and challenges, combined with education and training opportunities that are directed at producing Airmen who possess the requisite skills, knowledge, experience, and motivation to lead and execute the full spectrum of Air Force missions.” AFDD 1-1, vii.

10 See UK Ministry of Defence, *British Air Power Doctrine*, AP 3000, Third Ed. (London: The Stationary Office, 1999); and Australia, Royal Australian Air Force, Aerospace Centre, *Fundamentals of Australian Aerospace Power*, Fourth Ed. (August 2002).

doctrine, CFC will rely on USAF [US Air Force] and US DOD [Department of Defense] Joint Air doctrine.”¹¹

Another problem with Canadian Air Force PME is that, at the moment, most senior Air Force officer PME ends at the Development Period (DP) 3 level with completion of the Command and Staff Course (CSC), as very few Air Force officers have attended DP 4 level courses at CFC.¹² This puts Canadian Air Force senior leaders at a disadvantage compared to their USAF counterparts, almost all of whom have completed DP 4 equivalent courses given by the Air War College. Furthermore, at the DP 3 level a number of changes have impacted on Air Force officer PME. Over the past few years the CSC curriculum has undergone a number of modifications. These modifications have put increased emphasis on planning processes and exercises and decreased the amount of time allocated to discussing such topics as air force history, leadership and C² issues in a comprehensive way at the graduate level. These topics, related to warfare theory and history, are critical to understanding how processes, like planning processes, work and can be modified. Nevertheless, there are still some in the CF who argue that theory has little place in the education of members of the CF.¹³

The fundamental role of theory in the critical analysis of leadership experience has provoked vigorous discussion among some members of the CF concerning the role of theory in preparing members of the CF for their jobs. Some in the CF fear that by studying subjects like leadership theory they will be turned into “academics” or “theoreticians” and will then no longer be effective military personnel.

It is, therefore, worth pointing out here the value of leadership theory to Air Force personnel. As members of the profession of arms in Canada, Air Force personnel, especially officers and senior Non-Commissioned Members (NCMs), are required to pursue “the highest standards of the required expertise” for their profession.¹⁴ As noted by *Duty with Honour*:

The expertise required by the military professional is determined by the direction, operation and control of a human organization whose primary function is the application of military force. Such an organization is supported by a sophisticated body of theoretical and practical knowledge and skills that differ from those in any other profession.

The foundation for this expertise resides in a deep and comprehensive understanding of the theory and practice of armed conflict—a theory that incorporates the history of armed conflict and the concepts and doctrine underpinning the levels inherent in the structure of conflict, ranging from the tactical and operational to the military strategic and political-military (policy) levels...¹⁵

A vital way of imparting the expertise required to master the profession of arms is through PME. As professional education, PME courses contain both theory and practice, and a great deal of theory in these courses supports the practice of the profession. For example, just as professional engineers must master certain theories founded in the physical sciences to practice their profession, military professionals must master theories of war, leadership and

11 CFC, AMSC Schedule for 27 September 2005, “A/JC/CPT 404/LE-3, Nature of Air Operations,” accessed 15 Oct 2005.

12 DP 3 level PME is for majors and lieutenant-colonels; DP 4 level PME is for colonels and above.

13 These observations by Allan English are based on his experience teaching at CFC since 1997 and his experience as co-chair of the Aerospace Studies Department at CFC from 2001-05. See also Goette’s observations in the next chapter or Richard Goette, “Command and Control Implications for Canadian Forces Air Expeditionary Operations,” in Allan D. English, *Canadian Expeditionary Air Forces*. Proceedings of the 2003 Air Symposium held at the Canadian Forces College. Bison Paper 5, (Winnipeg: Centre for Defence and Security Studies, 2004), 67-82.

14 DND, *Duty with Honour*, 11.

15 *Ibid.*, 17.

command to be competent to practice their profession. The excuse given by some that they are too busy doing operations to engage in serious professional military education seems a rather strange argument to many in other professions, such as medical doctors or lawyers, who accept that they must set time aside on a regular basis to upgrade themselves professionally.

It is unfortunate that some in the CF still seem to think that theoretical knowledge and academic rigour are incompatible with their duties. The US military has recognized for years that academic rigour is essential to PME and that theory is not taught for theory's sake or to make military members theorists, but to enable them to apply relevant theories to the practice of their profession. Therefore, one of the aims of this chapter is to provide theories and accounts of experience that will help Air Force officers understand how the practice of their vocation is tied closely to an ability to apply theories of leadership and command in an air force context.

In both this chapter and the next chapter on command, the terms leadership, command, and management are used. While these terms are defined in CF doctrine (see the Glossary), it is sometimes difficult to distinguish among them because the complexity and “inter-relationships and interconnectedness of command, management, and leadership functions often make it difficult to disentangle the command, management, and leadership effects achieved by individuals in positions of authority. Hence favourable results tend to be attributed to extraordinary leadership even when they may, in fact, be the result of command or management skills, some combination of all three, or other factors – including luck [*italics in original*].”¹⁶ Therefore, the usage here reflects the inter-relationships and interconnectedness of these terms.

To put Air Force leadership in context, the first part of this chapter addresses the issue of environmental (or service in other countries) differences in leadership and suggests which aspects of Air Force leadership are different from leadership in the Army and Navy. The second part gives a brief example of how leadership theory, as enunciated in CF leadership doctrine, can be applied to any air force leadership experiences. The chapter concludes by proposing some suggestions for future research and ways of addressing the “profound lack of effective leadership” in some parts of the Air Force.

Differences in Leadership among the Army, Navy and Air Force¹⁷

Introduction. At the end of the 20th century warfare was increasingly characterized by operations where the forces of different nations fought together in coalitions and different services (army, navy and air force) worked together closely to accomplish a mission. These operations are often called combined and joint, respectively. At the beginning of the 21st century, new security challenges have caused many Western nations to have their armed forces work much more closely with other agencies, and this phenomenon has added expressions like Joint, Interagency, Multinational, and Public (JIMP); 3D (defence, diplomacy and development); and “integrated” to the national security lexicon. Working in these environments creates leadership challenges at all rank levels in the military. While there is some literature on the challenges of working in multi-national coalitions, the literature on leadership in joint operations, let alone in the new integrated operating environment, is extremely sparse, despite the fact that joint operations are even more numerous than combined operations and integrated operations are becoming the norm.¹⁸

16 DND, *Leadership in the Canadian Forces: Conceptual Foundations* (Kingston: Canadian Defence Academy, 2005), 10.

17 This section of the paper is based on Allan English, “The Masks of Command: Leadership Differences in the Canadian Army, Navy and Air Force,” in Allan English, ed., *Leadership and Command and the Operational Art*.

18 The idea of national differences in operational-level command styles is examined in Howard Coombs, “Perspectives on Operational Thought,” in Allan English, ed., *Leadership and Command and the Operational Art*, 75-96.

Some may assume that the CF has overcome the problem of environmental (or what most nations refer to as service)¹⁹ differences in leadership because it is, in law, a unified service. Yet, even in the unified CF, where basic training and many courses are conducted in a joint environment, many leaders spend their most formative years in a single service culture that shapes their attitudes, values and beliefs about what is an appropriate leadership style. These differences have been recognized in recent CF doctrinal manuals.

Two CF publications have recently codified and described in detail, for the first time, what it means to be a leader in the CF. As well as providing doctrinal guidance for members of the CF, *Duty with Honour* and *Leadership in the CF: Conceptual Foundations* (hereafter *Conceptual Foundations*) also provide frameworks and theoretical models to analyze Canadian military leadership. Both these publications acknowledge that despite many similarities, there are environmental differences in culture,²⁰ based on the unique physical environments in which the Canadian Army, Navy and Air Force operate. These unique physical operating environments have produced a unique body of professional knowledge,²¹ experience, and therefore, culture for each Environment. *Duty with Honour* acknowledges that differences among the three Environments are “essential for readiness, generating force and sustaining a multi-purpose, combat-capable force.”²² And these differences account for why “all three Environments often manifest certain elements of the [CF’s] ethos in different ways; for example, the influence of history, heritage and tradition or how team spirit is promoted and manifested.”²³ Consequently, *Duty with Honour* recognizes that the CF must accommodate the separate identities of the Army, Navy and Air Force.²⁴ *Conceptual Foundations* notes that “leaders are formed and conditioned by their social environment and culture;”²⁵ therefore, we can expect to see differences in leadership styles in the Canadian Army, Navy and Air Force based on these environmental differences in professional expertise and culture.

These environmental differences also influence judgments about what constitutes “good” and “bad” leadership styles. One of the biggest problems in the CF today is a lack of understanding about the differences in environmental leadership styles. For example, in conversations with the author (English) some army officers have characterized certain senior leaders from the other services in joint appointments as indecisive or not forceful enough because they employ participative- or delegation-based leadership styles. And some army officers have even remarked on the lack of physical fitness or the small stature of air force and navy leaders in the context of perceptions of their less than adequate leadership. On the other hand, some officers of the other two Environments have from time to time described certain senior army leaders in joint appointments as “all muscle and no brains” because they put physical fitness ahead of intellectual competency or because they are

19 Before unification Canada had three separate services: the RCN, the RCAF, and the Canadian Army. After 1 February 1968, when the Canadian Forces Reorganization Act took effect, all Canada’s armed forces were unified into a single service – the CF. While the RCN, the RCAF, and the Canadian Army no longer existed as legal entities, people often referred to the navy, air force and army in everyday usage. However, to emphasize the point that Canada no longer had three services, DND bureaucrats coined the rather awkward term “environment,” based on the environments in which the sea, air, and land components of the CF operate, to describe these three components of the CF. Since there is only one military service in Canada today, the CF, official DND publications sometimes use the noun “environment” and the adjective “environmental” when referring to the sea, air, and land components of the CF. Nonetheless, the terms Canadian Army, Navy and Air Force are creeping back into official usage.

20 DND, *Duty with Honour*, 51.

21 Ibid., 59.

22 Ibid., 74.

23 Ibid., 25.

24 Ibid., 74.

25 DND, *Conceptual Foundations*, 4.

perceived as micromanagers when they try to make forceful interventions, using directive leadership behaviours in areas where they have little expertise and where their subordinates are used to more transformational leadership styles.²⁶

Many of these views are based on service-based expectations about what good leadership looks like. Some of the views are based on stereotypes, others on fact. However, we currently have very little in the way of research to sort myth from reality on this topic. In fact we have not even identified, in any systematic way, all the environmental-based views on leadership. Many of these views have historical roots; therefore, the approach taken here will be to put the leadership differences of the Canadian Army, Navy and Air Force in a historical context by looking at aspects of how and why they developed in the ways they did, and then by speculating on how they have been evolving. Perhaps by examining aspects of Canadian military leadership over a relatively long period of time we can come to a better understanding of the challenges of Air Force leadership in joint and integrated environments in the 21st century.

While most of the military leadership literature focuses on the experience of land forces, almost all military personnel know from their own experience that there are distinct differences in the leadership styles commonly used in the army, navy, and air force. Each service has a unique culture that influences acceptable leadership styles in that service. At the same time, each nation has a culture that is another variable in the leadership equation. This means that studies done by other nations are not necessarily applicable to the Canadian context. Therefore, to address some of the gaps in the literature leadership differences in the context of the cultures of the Canadian services will be examined. Air force leadership experiences have been emphasized here in an attempt to widen the field of leadership studies beyond the existing land-centric focus. It is accepted here that personalities can have a greater impact on leadership style than service background, but that field will be left to others to examine. It is also acknowledged that there are many similarities in service leadership styles. But the emphasis here will be on the more neglected, yet equally important, aspect of differences in leadership, as this has become particularly relevant in today's context of joint and integrated operations where leaders of the three services interact more regularly than in the past.

History as a Window on Leadership. The study of military leadership and the culture upon which that leadership is based is most effective when conducted as a multi-disciplinary endeavour where each discipline contributes to the endeavour. History's contribution to this undertaking is to provide both data and context. Historians specialize in the evaluation of sources, everything from documents held in archives to oral histories, to produce verifiable data for the study of leadership in the past. Perhaps just as important, historians describe the times in which military leaders lived, including the culture that shaped the leaders, and in which they exercised command. As Sir Basil Liddell Hart put it, history tries "to find out what happened while trying to find out why it happened." In so doing, it seeks causal relationships between events that can provide analogies that may not teach us exactly what to do today but can teach common mistakes. Liddell Hart also tells us that history has a practical value because historical experience is infinitely longer, wider and more varied than individual experience.²⁷

Heroic Leadership. One of the most popular historical books on military leadership is John Keegan's *The Mask of Command*, "a book about the technique and the ethos of leadership

²⁶ See DND, *Conceptual Foundations*, 64-71, for a more detailed description of leader influence behaviours.

²⁷ B.H. Liddell Hart, *Why Don't We Learn From History?* (New York: Hawthorn, 1971), 15.

and command.” Keegan argues that European culture produced a distinctive leadership style that joined Alexander the Great and Wellington across the centuries in “motive and method,” despite subtle shifts in culture that made them somewhat different.²⁸

Based on Keegan’s analysis, one can see that every individual mask of command is unique (based on factors such as personality, previous experience, education and so on), but that some of the framework of the mask may be common to all three services, especially in Canada where a significant amount of officer leadership education and training is done in a tri-service environment. Nevertheless, since most formative operational leadership experiences occur during an officer’s early years in the military and since much of this time is spent in a single environment, each officer’s mask bears a distinctive service imprint.

A key theme in Keegan’s book is that good leaders authenticate themselves in their leadership role by sharing risks with their followers. This cultivates a kinship between leaders and their followers and gives leaders the moral legitimacy, beyond their legal authority, that they must have to be successful. Keegan defined the heroic style of leadership as “aggressive, invasive, exemplary, risk-taking.”²⁹ Based on Keegan’s analysis, this revised definition of heroic leadership in a 21st century context is offered—conspicuous sharing of risk with subordinates.

Keegan’s examination of leadership was based on a comparison of the masks of command used across the centuries, among various nationalities, but primarily focussed on land forces. This survey of leadership extends Keegan’s analysis by looking at some of the masks of command used in the past 100 years by leaders of the air force in particular. However, to properly understand leadership in the past 100 years, in addition to Keegan’s “heroic” leadership, it is necessary to understand another type of leadership that became increasingly important in the 20th century and that has become indispensable in the 21st century.

Technical Leadership. Technical leadership, as used here, is defined as the ability to influence others to achieve a goal based on the specialized knowledge or skill of the leader. Technical leadership is exercised by leaders who must be able to either actually do the same job as their subordinates (e.g., pilots), or by leaders who must have a significant specialized knowledge of the jobs that their subordinates perform (e.g., the seamanship skills of the naval officer). This type of leadership is critical in the navy and air force where every second they are at sea or in the air those on board ships and aircraft depend on technology, and by extension the technical ability of the crews and their leaders, for their very survival, not just their ability to fight. Technical leadership is most clearly different from the traditional concept of army leadership in pilots who must, as we shall see, be able to demonstrate an acceptable level of flying skill before they will be accepted as leaders.

While technical leadership is found in all three services in different proportions (as shown in Figure 5.1), it is argued here that the fact that navy and air force leaders are given regular assessments of their technical ability, not just leadership skills, shows how important this technical aspect of leadership is in these services. This is particularly evident in the air force where aircrew leaders at all levels are given regular check rides by designated standards personnel who may be junior in rank to the person being evaluated.

However, the land-centric focus of much of the leadership literature leads many, particularly those with little knowledge of military culture, to assume that the masks of command used

28 John Keegan, *The Mask of Command* (London: Jonathan Cape, 1987), 113, 118-19.

29 Ibid., 10.

in the navy and air force are nearly identical to those masks used in the army. This next section will examine service differences in leadership in a general context.

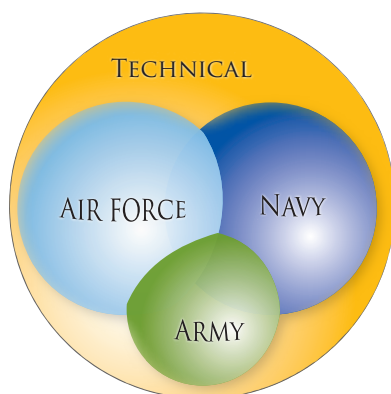


FIGURE 5.1. TECHNICAL LEADERSHIP BY ENVIRONMENT

Differences in Service Culture. Carl Builder's model of the cultural differences among the American services is a useful starting point because it outlines some general characteristics of Western army, navy and air force cultures today. Builder contends that the touchstone of US Army's organizational culture is the art of war and the profession of arms; in other words concepts and doctrine are the glue that unifies the Army's separate branches. For the US Navy, the heart of its organizational culture is the Navy as an institution, based on tradition, plus a maritime strategy, that provide coherence and direction to the Navy. The US Air Force in contrast, he declared, has identified with platforms and air weapons rooted in a commitment to technical superiority, and it has transformed aircraft or systems into ends in themselves. Builder claimed this lack of an air force vision has had serious repercussions for it. Writing in the early 1990s, Builder maintained that, because the US Air Force had no integrating vision like the US Army's AirLand Battle or the US Navy's Maritime Strategy, it had conceded the intellectual high ground to the other services particularly the Army.³⁰ Builder does not discuss the US Marine Corps culture in detail, but it has been described as worshipping "at the altar of its uniqueness," and because of its unique roles it has not been as strongly affected by the end of the Cold War as the other US services have been.³¹

We can see some similarities in Canadian service culture in Builder's model. For example, the Army invests a great deal in doctrine; the Air Force invests very little and remains focussed on platforms;³² and the Navy with its deep rooted traditions and maritime strategy, "Leadmark," exhibits many cultural similarities to its American analogue. However, beyond these basic similarities with the American services, Canadian military culture is based on its own historical experience.³³

In the discussion that follows the proposition that Canadian military leadership in the three Environments is balanced differently in unique ways between heroic leadership and what

30 Carl H. Builder, *The Icarus Syndrome: The Role of Air Power Theory in the Evolution and Fate of the US Air Force* (London: Transaction Publishers, 1994), 5-7.

31 Walter F. Ulmer, Jr. et al., *American Military Culture in the Twenty-First Century* (Washington, DC: CSIS Press, 2000), 13.

32 See Brian D. Wheeler, et al., "Aerospace Doctrine?" in David Rudd, et al., eds., *Air Power at the Turn of the Millennium* (Toronto: Canadian Institute of Strategic Studies, 1999), 141-77 for an overview of the problems with Canadian aerospace doctrine. A more detailed account may be found in John Westrop, "Aerospace Doctrine Study," unpublished report dated 30 April 2002, copy at Canadian Forces College library.

33 Canadian military culture is discussed in detail in Allan English, *Understanding Military Culture: A Canadian Perspective* (Montreal & Kingston: McGill-Queen's University Press, 2004).

has been called technical leadership will be examined. This hypothesis about the balance between heroic leadership and technical leadership in the services will be discussed, focussing on the perceived air force-army cultural dichotomy to attempt to achieve greater clarity in distinguishing among the subcultures that affect leadership in the CF.

Air Force Leadership. Air force leadership is used as a focus here, not only because it is the subject of this book, but also because: (1) it provides the greatest contrast with the army leadership that is well described in the literature; (2) if the Revolution in Military Affairs (RMA) is leading armed services towards a greater reliance on technology, perhaps the air force style of leadership may be more prevalent in the future; and (3) since the air force is the newest of the three services, we can see some of the roots of its leadership quite clearly.

It is also worth noting that much of the army-centric literature on military leadership is based on Cold War and pre-Cold War data and experience. However, in the post-9/11 world, the international security situation and concepts like Fourth Generation Warfare (4GW) and Idea-Driven Warfare have altered the way in which Western armed forces conduct operations.³⁴ Therefore, there are indications that the post-9/11 environment is forcing armies to conduct operations in ways that resemble air force operations, as described in Chapter 4 in the section “‘The New World Disorder’ and CF Air Force Operations,” more than the Cold War and many pre-Cold army models for operations. It is still too early to tell, but new data and experience are beginning to change some long held ideas about army leadership.³⁵

In this discussion of air force leadership, the focus will be on the First and Second World Wars since they form the main basis of our combat experience. Also, since the downsizing of the Directorate of History and Heritage and the cancellation of post-war volume of the Official History of the Royal Canadian Air Force, our knowledge of post-Second World War air force history is quite limited. Also, by necessity, I will focus on aircrew leadership as virtually no research has been published on groundcrew leadership.³⁶

Until June 1918, with the formation of the Canadian Air Force (which through a number of steps eventually became the RCAF in April 1924), Canadians who wanted to serve their country in the new dimension of air warfare had to join the British air services, the Royal Flying Corps or the Royal Naval Air Service (combined into the Royal Air Force in April 1918). Before having an air service of their own, Canadians made an important contribution to the Imperial flying services. For example, in 1918 about 25 percent all RAF flying personnel and perhaps 40 percent of RAF pilots on the Western front were Canadian, and there were about 22,000 Canadians in the RAF.³⁷ Therefore, the history of Canadian air force leadership starts with the British air services. Since the RFC had the greatest influence on RAF and RCAF leadership practices the focus at first will be on it, even though an entirely separate study could be done on naval aviation leadership.

Before the First World War and during the first two years of the war, almost anyone who could get a private pilot's licence and met basic enrolment standards was accepted to fly for the RFC, still a part of the British Army at that time. Pilots held ranks ranging

34 See Allan English, “The Operational Art,” in Allan English, et al., eds., *The Operational Art*, 52-3 for a discussion of this issue.

35 See for example Uzi Ben-Shalom, et al., “Cohesion during Military Operations: A Field Study on Combat Units in the Al-Aqsa Intifada,” *Armed Forces & Society* 32, no. 1 (October 2005), 63-79.

36 Some of the concepts discussed here have been developed further in an essay titled “Leadership and Lack of Moral Fibre in Bomber Command 1939-1945: Lessons for Today and Tomorrow,” in *Historical Perspectives of Mutiny and Disobedience, 1939 to Present* (Kingston: Canadian Defence Academy Press, in press).

37 S.F. Wise, *The Official History of the Royal Canadian Air Force. Vol.1: Canadian Airmen and the First World War* (Toronto: Univ. of Toronto Press, 1980), 597.

from Corporal to General Officer, and a pilot's rank was more dependent on his social status than flying ability. In these early days of military flying, two-seater aircraft were frequently commanded by the observer, often an artillery officer, who outranked the pilot. This haphazard system of getting aircrew for the RFC was gradually replaced by a formal military training system. In 1918 one of its largest formations, the Training Division (about 20,000 all ranks), was commanded by the highest ranking Canadian in the RAF, the 28 year old Brigadier General A.C. Critchley. Interestingly, he was neither a pilot nor an observer, but a former cavalry officer who was seconded from the Canadian Corps because of the reputation he had established as an outstanding trainer of land forces. He continued his good work with the Training Division and is credited with modernizing its training methods.³⁸

This method of selecting commanders on merit rather than occupation or flying ability was not uncommon in the British flying services in the First World War. For example, Sir Hugh Trenchard, the "father of the RAF" only learned to fly in 1912 as a major when it seemed that at age 39 his career in the infantry (Royal Scots Fusiliers) had reached a plateau. Three years later he was a Major-General commanding the RFC in France. Trenchard had no operational flying experience let alone combat flying experience; however, this was no barrier to his becoming an effective and highly respected commander of the largest part of the RFC in the field. He personally set the standard for air force leadership based on the army customs he was familiar with. His biographer tells us that one morning in 1916, when he was General Officer Commanding of the RFC in France, Trenchard came across an overzealous officer punishing some mechanics for infringing a minor regulation by sending them on a wet cross-country run before breakfast. Trenchard admonished him as follows: "Get this into your thick head...This is a technical corps...You're not in the army now, you know."³⁹ Most of Trenchard's career had been spent in the infantry (in the "golden years" of the British Army's regimental system) and his biographer tells us that "Pride in the regiment could never be an abstract sentiment to Trenchard. It had to be felt personally, or nothing."⁴⁰ Because Trenchard's remarks were made at least two years before the formation of the RAF as an independent service, this tells us that in the British Army at that time there was a recognized form of "technical corps" leadership that was different from that used in the "regular army," what might be called the combat arms today.

Trenchard and his successors used this style of technical corps leadership to maintain the effectiveness of an organization that suffered heavy losses throughout the war. For example, by 1918 losses among RFC fliers were running as high as 32 percent of unit strength *per month* during offensives.⁴¹ From a leadership perspective this had important consequences. Senior leaders, like Trenchard, tended to be men in their late thirties or older, but because they rarely, if ever, flew in combat, there was little attrition among them. On the other hand, junior leaders, especially at squadron level and below, were being killed at an alarming rate. Aggressive, lead-from-the-front tactics in the air led to high casualties among squadron and flight commanders, and soon squadrons were being routinely led by men in their early twenties. By April 1917 the leadership crisis was so great that squadron Commanding Officers (COs) were forbidden to fly within five miles of enemy lines. Some returned to fight in the trenches explaining that they would not risk their subordinates' lives if they could not put their own lives on the line; others broke the rules and flew over enemy territory anyway. It seems that things had become so bad by the end of the war that

38 Wise, *Canadian Airmen and the First World War*, 597; and A. C. Critchley, *Critch!: The Memoirs of Brigadier-General A.C. Critchley* (London: Hutchinson, 1961), 88.

39 Andrew Boyle, *Trenchard* (London: Collins, 1962), 96-141. Citation from 199.

40 Ibid., 33.

41 Wise, *Canadian Airmen and the First World War*, 100-1, 118.

some older army officers, “skilled in the handling of men,” were assigned to command squadrons.⁴² The rationale for this practice was offered by the official historian of the RFC/RAF:

A man with a talent for command, who can teach and maintain discipline, encourage his subordinates, and organize the work to be done, will have a good squadron, and is free from those insidious temptations which so easily beset commanding officers who have earned distinction as pilots.⁴³

We can see by this comment, written just after the war, that some people believed that there had been problems with promoting young men in their early twenties to command squadrons, whatever their flying skills might have been. A similar situation arose in the CF a few years ago with Tactical Helicopter detachments being deployed to Bosnia. The question was asked whether the practice of having the senior pilot command the detachment (at this point many were young and inexperienced majors) should be replaced by having the senior major (usually an engineering officer) command the detachment; however, no change to the policy of the senior pilot being in command was implemented.⁴⁴

While there is no detail about the results of this First World War leadership experiment, it would be interesting to pursue it further. However, I would guess that it was a dismal failure because of the requirement for an effective squadron commander to demonstrate both technical skill and heroic leadership, as shown by the example that follows.

Examples of Heroic and Technical Leadership in the Air Force. The best squadron COs in both world wars were bold, skilled airmen who led by example. Those who were most admired carried out their orders intelligently and used their expertise to minimize the risks to the lives of their charges.⁴⁵ Sometimes exceptional technical skill was required to do this.

Victoria Cross winner Lanoe Hawker’s unit was the first to be equipped with DH2 aircraft, which had been rushed into service to counter the “Fokker scourge,” when the RFC was suffering large numbers of casualties at the hands of the newly introduced Fokker E.1 fighters that were the first aircraft to have interrupter gear allowing them to fire their machine guns forward through the arc of their propellers. Unfortunately for the RFC, the DH2 had a number of manufacturing and technical problems, and it was soon dubbed the “Spinning Incinerator” by the pilots who flew it. On 13 February 1916, two of Hawker’s best pilots were killed in accidents involving spins on their own side of the lines. Rumours quickly circulated among his pilots that these machines were death traps. A complete collapse in squadron morale seemed imminent, and Hawker had to act quickly. Immediately after the fatal accidents, he took a DH2 up on his own and recovered from every possible spin condition. He then explained the proper manoeuvres to his pilots, and they all practiced them until they were proficient in spin recoveries. After that, while Hawker was in command, his squadron did not lose another flier from spinning into the ground. Thus, a potentially

42 Allan D. English, *The Cream of the Crop: Canadian Aircrew 1939-1945* (Montreal and Kingston: McGill-Queen’s Univ. Press, 1996), 65.

43 Walter Raleigh, *War in the Air*, Vol. 1 (Oxford: Clarendon Press, 1922), 438.

44 See Allan English, “Leadership and Command in the Air Force: Can Non-Aircrew Command Flying Squadrons?” in Office of Air Force Heritage and History, ed., *Proceedings: 6th Annual Air Force Historical Conference* (Winnipeg, MB: Air Force History and Heritage, 2000), 79-86, for a discussion of this issue.

45 See for example Jean Beraud Villars, *Notes of a Lost Pilot*, trans. by Stanley J. Pincetl, Jr. and Ernest Marchand (Hamden, Conn.: Archon Books, 1975), 97, 146-7, 169, 200; Roger Vee, (Vivian Voss), *Flying Minnows: Memoirs of a World War I Fighter Pilot from Training in Canada to the Front Line, 1917-1918* (London: Arms and Armour Press, 1976), 239; Curtis Kinney with Dale M. Titler, *I Flew a Camel* (Philadelphia: Dorrance, 1972), 88; and English, *Cream of the Crop*, 65.

serious morale problem was avoided by a CO demonstrating his flying competence and by taking a personal risk.⁴⁶

This next example of air force leadership is taken from the Second World War to show that while the principle was the same, different circumstances called for different actions. In terms of total losses, Bomber Command suffered grievously compared to other formations, on what has been called the “cutting edge of battle.” Canadian rifle companies fighting the early campaigns in Italy, and British and American infantry in Normandy experienced casualty rates of 50, 76, and 100 percent of unit strength respectively.⁴⁷ Bomber Command casualty rates for 1943 was 250 percent of unit strength.⁴⁸ During the Allied Combined Bomber Offensive (1942-45), 18,000 aircraft were lost, 81,000 British, Commonwealth and American fliers were killed, and combat casualties exceeded 50 percent of aircrew strength on average.⁴⁹ Naturally, aircrew leadership was a formidable challenge in these circumstances.

Unlike most of their First World War counterparts, RAF Bomber Command squadron COs could not lead by being visually conspicuous to their followers. Most of their “ops” (operations) were conducted at night in loose bomber streams where crews might never see another aircraft. Therefore, Bomber Command leaders had to use novel methods to demonstrate heroic leadership and technical competence. The case of the RAF’s 76 Squadron in 1943 is one such example.

Some COs got the derisive nickname “Francois” from their subordinates because they usually participated only in relatively safe raids on France. Not Leonard Cheshire. He deliberately elected to fly as second pilot “with the new and the nervous” on dangerous raids. In this way he demonstrated competence and risk taking to his followers. By the end of the war, Cheshire had earned a Victoria Cross, 3 Distinguished Service Orders, a Distinguished Flying Cross, and had become “a legend.” His replacement had a much different experience. Rarely flying on dangerous ops, and plagued with “bad luck” early returns, the new CO saw the unit’s efficiency and morale deteriorate alarmingly. By the spring of 1943, 76 Squadron’s early return rate sometimes exceeded 25 percent of the aircraft dispatched. At the end of 1943 this CO was replaced. His successor, “Hank” Iveson, resumed the custom of the CO flying dangerous missions, and he broke up crews with persistent early return records. This resulted in better unit performance which significantly improved morale, but a CO had to be constantly alert to maintain it at a high level. When the squadron was re-equipped with the new Mark III Halifax, which had a “fearsome reputation for accidents,” Iveson and his three flight commanders flew on the first operational mission with this aircraft to demonstrate their confidence in the squadron’s equipment.⁵⁰

The example of 76 Squadron shows how aircrew would follow charismatic leaders. Crews could not be driven to their tasks in Bomber Command; there were too many ways to shirk them, especially on night operations, if they felt their leaders were letting them down. For

46 Tyrrel Mann Hawker, *Hawker, V.C.* (London: Mitre Press, 1965), 125, 129, 135, 140-3. This example was first presented by Allan English, “Leadership and Lack of Moral Fibre in Bomber Command 1939-1945,” paper given at the first Air Force Historical Conference, Air Command Headquarters, Winnipeg, Manitoba, 18-19 November 1994. Published in William March and Robert Thompson, eds. *The Evolution of Air Power in Canada*, Vol. 1. Winnipeg, MB: Air Command History and Heritage, 1997, 67-75.

47 John A. English, *On Infantry* (New York: Praeger, 1984), 138.

48 Allan English, *Cream of the Crop*, 101.

49 Mark K. Wells, *Courage and Air Warfare* (London: Frank Cass, 1995), 2.

50 Max Hastings, *Bomber Command* (New York: Dial Press, 1979) 247-8, 252. This example was first presented by Allan English, “Leadership and Lack of Moral Fibre in Bomber Command 1939-1945” in 1994.

example, they could “deliberately sabotage” their aircraft to avoid going on ops,⁵¹ they could “boomerang” (return early), or become “fringe merchants” (those who bombed on the edge of the target to avoid defences). And as the bombing campaign penetrated further into Germany, in order to get above the defences, crews could jettison their bombs in the sea or over occupied Europe.⁵² Good Bomber Command leaders inspired their men to press home the attack in the face of overwhelming odds against survival.⁵³

Even at the higher levels of air force leadership risk had to be shared from time to time for commanders to have credibility with the crews. On Bomber Command’s first 1000 plane raid (30-31 May 1942) casualties were expected to be high⁵⁴ and one station commander is quoted as having said:

The C-in-C says you will spread apprehension and despair throughout Germany... I have therefore delegated my duty in the Ops Room...in order to satisfy my pleasure in observing your firework display from the rear turret of ‘A’ Flight Commander’s aircraft.⁵⁵

By choosing to fly on what was expected to be Bomber Command’s most dangerous raid of the war to date in the most hazardous position of the aircraft, this station commander was an inspiration to his crews, and on this raid at least one group commander (two star general equivalent) and several other station commanders flew with their men.

Based on the historical record, it appears that there were several types of wartime air force leadership, each with a different balance between technical and heroic leadership styles. At the unit level, good flight commanders exhibited high levels of technical and heroic leadership. The requirement for technical leadership started to diminish at the squadron commander level, but the requirement for heroic leadership was still high. At the formation level (from colonel equivalent up to two star generals, wing commanders up to group commanders), the requirement for technical leadership in the form of aircraft handling skills diminished, but occasional heroic leadership was still necessary to inspire confidence in aircrews. At the highest level of air force command, technical leadership (in the sense of flying skills) was not important at all. Physical risk taking also was not required, but these leaders were expected to risk their careers for the welfare of their crews. For example, Trenchard and Sir Arthur “Bomber” Harris were not expected fly at all; in fact Harris almost never left his HQ or visited units, but both were perceived to demonstrate exceptional concern for the welfare of their subordinates especially in getting resources (like new equipment and more personnel) for them. Despite the fact that Harris was nicknamed “Butch” (for Butcher) by his crews, not because of what he was doing to Germany but because of what he was doing to them, veterans of Bomber Command showed exceptional loyalty to Harris after the war. Most of them believed that he had done everything he could

51 Some examples are given by Hastings, *Bomber Command*, 248 (deliberately fouling the magnetos while running up the engine); and Norman Longmate, *The Bombers* (London: Hutchinson, 1983), 184 (tampering with gun-turret hydraulic systems).

52 The number of bombs “jettisoned” during the Battle of Berlin has been described as “enormous,” Charles Webster and Noble Frankland, *The Strategic Air Offensive Against Germany 1939-1945*, Vol. 2 (London: HMSO, 1961), 195-6. Bomber Harris was aware of these problems. The policy of having tour lengths defined by successful sorties, where possible confirmed by photos taken at bomb release, was designed to discourage “fringe merchants” and “boomerangs.” Charles Messenger, *“Bomber” Harris* (London: Arms and Armour Press, 1984), 90; and John Terraine, *The Right of the Line* (London: Hodder & Stoughton, 1985), 524.

53 Hastings, *Bomber Command*, 247-8, 252.

54 RAF casualties were a record high 43 aircraft lost (4 percent of the 1,047 attacking). Martin Middlebrook and Chris Everitt, *The Bomber Command War Diaries* (London: Penguin, 1990), 272.

55 Longmate, *The Bombers*, 221.

to ensure their welfare and that his strident advocacy of Bomber Command had caused him to be slighted in the post war honours list.⁵⁶

The leadership examples given above suggest that perhaps the greatest differences between army and air force leadership are at the lower levels. In wartime flight and squadron commanders were expected to demonstrate a type of heroic leadership that Keegan attributed to Alexander, but based on specialized knowledge and skills, particularly the ability to fly and fight an aircraft. As officers in the army and air force achieve senior rank, however, their masks of command may start to look increasingly similar. Another similarity between army and air force leadership is the assumption that it is more appropriate for certain occupations, like the combat arms (aircrew in the case of the air force), to provide the bulk of the leaders in the organization. In the air force, this could be called the cult of the pilot.

The Cult of the Pilot. At the beginning of the First World War a person's military occupation (like pilot) did not automatically determine leadership status in the RFC/RAF, as we have seen. Furthermore, as the war became more technically complex, new occupations were created, such as armaments, photography, and wireless, to complement the earlier technical trades of riggers and fitters and support trades like administration, motor transport, and stores. With the huge increase in size of the British air services, from just over 2,000 men in 1914 to the RAF with over 290,000 men and women in uniform in 1918,⁵⁷ all of these specialties developed their own officer and NCO corps that were responsible for overseeing the technical expertise necessary to keep the flying services operational.⁵⁸

However, after the war the RAF and the Canadian air services were drastically reduced in size. In terms of leadership, this meant that most specialists were demobilized and almost the entire officer corps consisted of pilots to ensure that as many of them as possible were available to fly in the minuscule air forces of the inter-war years. One reason for this policy was that even constant peacetime flying took its toll due to stress, and ground jobs were generally reserved for pilots who were taking a break from flying. In addition to their flying duties, career air force pilots were expected to specialize in another trade, e.g., armaments, photography, navigation.⁵⁹ At the time the RCAF referred to pilots as "general list" officers (the RAF still refers to its aircrew as "General Duties" officers) because they are not viewed as specialists, but people who can fly and still do ground jobs. Specialists, like "engineering officers", can only perform ground duties. So the inter-war years saw the rise of the "cult of the pilot" where Trenchard and his Canadian protégés enforced his wartime dictum that pilots were more than airborne chauffeurs and would fill virtually all command positions.⁶⁰

For the Canadian air force, this changed with the Second World War and the huge expansion of the RCAF. In 1938 its strength was 1,150 all ranks; it reached a wartime peak of 206,350 at the end of 1943, and 46,272 of that number were overseas. In addition, the British Commonwealth Air Training Plan furnished 44 percent of the 340,000 Commonwealth aircrew trained between 1939 and 1945. Most of the training for the RCAF's expansion was done in Canada. With the outbreak of the war Canada went from training 10-20 pilots per

56 See Dudley Saward, "*Bomber*" Harris (London: Cassell, 1984), 324-34, for a spirited defence of Harris's reputation.

57 H.A. Jones, *War in the Air, Appendices*, (Oxford: Clarendon Press, 1937), Appendix XXV.

58 Denis Winter, *The First of the Few* (Athens, GA: Univ. of Georgia Press, 1983), 110-120 gives a description of some of the work performed by groundcrew in the First World War. H.A. Jones, *War in the Air, Vol. 5* (Oxford: Clarendon, 1935), Chapter 8 gives an account of how training for the new trades was conducted.

59 W.A.B. Douglas, *The Official History of the Royal Canadian Air Force. Vol. 2: The Creation of a National Air Force* (Toronto: Univ. of Toronto Press, 1986), 145.

60 This point was brought to the attention of American officers during a May 1917 visit to RFC Canada, where they were told that the pilot was not "a flying chauffeur," but "modern cavalry officers" or a "knight of old," Hiram Bingham, *An Explorer in the Air Service* (New Haven: Yale Univ. Press, 1920), 16-17.

year to over 5,000 aircrew of all types *per month* under the BCATP.⁶¹ Aircrew usually held a minimum rank of Sergeant, and commissions in the RCAF were granted on the basis of marks in flying training with about one half of the pilots being commissioned initially.⁶² By the end of the war, virtually all Canadian aircrew were commissioned at the end of training. As in the inter-war years, pilots held most of the major command positions. But by 1942 the high loss rates and trouble finding enough good leaders among the pilots led to a fierce debate in the RAF and RCAF over whether other aircrew trades could command squadrons and flights. Necessity provided the answer and soon navigators, and a few Wireless Operator Air Gunners and other aircrew trades, were given command positions.⁶³

As in the First World War, the massive expansion of the technical trades led to the reappearance of the officer and NCO hierarchies that had almost disappeared after that war. Even so, it was the aircrew who did most of the dying. While groundcrew outnumbered aircrew about five to one, 94 percent of the RCAF's fatal casualties were aircrew.⁶⁴ After the Second World War, despite the continued existence of most of the technical branches and some of their officers and senior NCOs, there was a return to the cult of the pilot that has persisted in the Canadian air force until relatively recently when officers from other occupations (e.g., air navigators) could command squadrons, an aerospace engineering officer could become Assistant Chief of the Air Staff, and most recently an air navigator could become Chief of the Air Staff.⁶⁵

The dominance of pilots in the air force command structure has had a number of implications for air force leadership. While a great deal more research is needed in this area, it might be fair to characterize air force groundcrew leaders as requiring more technical leadership skills than aircrew as shown in Figure 5.2.

Besides the degree of technical leadership style used by aircrew and groundcrew officers, there are other significant differences between them. Unlike most groundcrew officers who, like junior army officers, often lead small sections as part of their first job, aircrew rarely get the chance to lead until they reach the rank of major and become flight commanders. Furthermore, most of their leadership experience is with peers and fellow officers and not airmen or airwomen. This also means that most aircrew do not receive mentoring from senior NCOs in their first command appointments in the same way that groundcrew officers do. Therefore, most senior aircrew leaders have very different formative experiences from groundcrew officers, and army officers, as they acquire their leadership skills. One would expect that this would lead to very different approaches to leadership in joint command situations.

61 F.J. Hatch, *Aerodrome of Democracy* (Ottawa: Directorate of History, DND, 1983), 101, 194, 205; and Douglas, *The Creation of a National Air Force*, 192, 226-7, 247.

62 Douglas, *The Creation of a National Air Force*, 221; and Allan English, *The Cream of the Crop*, 120-1.

63 See PRO AIR 14/290 particularly BC/C.23068 and attached minute sheets for details. Sir Arthur Harris's approval for this new policy is at minute 43.

64 C.P. Stacey, *Arms, Men and Governments* (Ottawa: Queen's Printer, 1970), 66, 305; and W.R. Feasby, ed., *The Official History of the Canadian Medical Services 1939-1945* (Ottawa: Queen's Printer), 512.

65 The cult of the pilot was less predominant in maritime patrol and maritime helicopter squadrons where naval traditions had some influence and there was less concern with the occupation of squadron and flight commanders as long as they were aircrew. See James F. Johnson, "Air Navigators and Squadron Command Opportunities," *Canadian Forces Polaris* 2, no. 1 (1973), 40-1. Issues of aircrew leadership also were raised by me in a number of presentations to air force officers starting in 1999 and first published as Allan English, "Leadership and Command in the Air Force: Can Non-Aircrew Command Flying Squadrons?" given at the 6th Air Force Historical Conference, Cornwall, ON, 21-23 June 2000 and published in Office of Air Force Heritage and History, ed. *Proceedings: 6th Annual Air Force Historical Conference*. Winnipeg, MB: Air Force History and Heritage, 2000, 79-86.

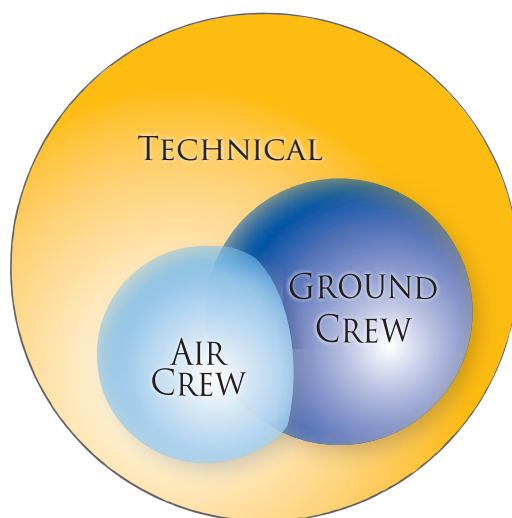


FIGURE 5.2. TECHNICAL LEADERSHIP WITHIN THE AIR FORCE

Environmental (Service) Leadership. These different approaches have some of their roots in how each environment or service is organized. This section of the chapter proposes some ways of looking at how these different organizations may produce different leadership cultures. Since very little research has been done on this topic, much of it is speculative and based on personal observations. It is hoped that this may stimulate some interest in these topics for future research. The differing hierarchies of loyalty in the three environments are indicative of cultural differences and these differences may shed some light on differences in service leadership.

It appears that because people change units [ships and squadrons] frequently in the navy and air force their hierarchy of loyalty is: (1) service [navy or air force], (2) job/occupation [maritime engineer, pilot, etc], then (3) unit [ship or squadron]. There is some culturally based evidence for this assumption as in the pre-unification RCN and RCAF the officers' cap badges were the same for all officers in each service.

For the army, an alternate interpretation is offered to what is found in much of the Canadian literature on army leadership, where it is assumed that the regimental system is at the heart of the army culture with a hierarchy of loyalty going from (1) regiment (2) branch [infantry, artillery, etc.], and then (3) the army as an environment. It is suggested here that the traditional interpretation is only really true for the infantry in the Canadian context. The armoured corps is more problematic because its members routinely re-badged to serve in Canadian Forces Europe up until 10 years ago, although today they tend to remain more within their regimental families. Other groups appear to owe their first loyalty to their job/branch/occupation [gunner, engineer, signals, etc.] because they do not have regiments in the same sense as the infantry. This produces a loyalty hierarchy as follows: (1) job/branch (2) service, then (3) unit. This hierarchy of loyalty may bear some resemblance to the navy and air force hierarchies because of the relatively high technical leadership component found in the cultures of these "other" army subcultures.

Conclusions. It is argued here that every service has different leadership expectations based on that service's mask of command. Even in the unified CF, where a significant amount of training and education is conducted in a joint environment, leaders spend their

most formative years in a single service culture that shapes their views about what is an appropriate leadership style.

To examine service leadership differences, two generic types of leadership have been used: heroic and technical. Heroic leadership, defined here as conspicuous sharing of risk with subordinates, appears to be common to combat leadership in all services. In addition to heroic leadership, it is suggested that there is a second generic leadership style called “technical” leadership and that style is found as a subculture, in different proportions, of each Environment’s (or service’s) culture.

Technical leadership is defined here as the ability to influence others to achieve a goal based on the specialized knowledge or skill of the leader. It is particularly important to air force and naval officers, who must display technical competence before they will be accepted as legitimate leaders by their subordinates. Technical leadership also has an effect on how members of the army, navy and air force form attachments that are the foundation of cohesion and morale.

Much in these models is speculative in nature and is more an invitation to others to conduct research into these areas of inquiry than a statement of any definitive findings. It is important to conduct this research, however, because understanding differences in leadership among the army, navy, and air force has become increasingly important in an era where joint and combined operations predominate and integrated operations are becoming the norm. Recent Canadian doctrinal publications on the profession of arms and leadership have provided a good base for understanding leadership in the CF. However, until we know a great deal more about differences in environmental (or service) culture and leadership, Canadians should be cautious about using longstanding stereotypes concerning service leadership and about accepting conclusions based on foreign data.

Applying Theory to Air Force Leadership Experience⁶⁶

Leadership in Bomber Command. Now that the CF has a sound theoretical and doctrinal basis for analyzing leadership experience, this part of the chapter will use an analysis of leadership in RAF Bomber Command in the Second World War, published in more detail elsewhere, to take advantage of these analytical tools to provide an example of how they could be used to improve Air Force leadership development in the future.

Bomber Command was chosen for this analysis because it was the fighting force that the RCAF contributed to more than any other in the Second World War, and Canadians serving in Bomber Command were subject to British policies and practices governing leadership, morale and discipline, a situation that might have some relevance to CF participation in coalition or multinational operations today. In 1944, about 40 percent of all RCAF aircrew posted overseas were sent to Bomber Command. By January 1945, 46 percent of Bomber Command’s pilots came from Canada, Australia, or New Zealand, and 55 percent of these Dominion fliers were Canadian.⁶⁷ Unfortunately for these airmen, Bomber Command also suffered the highest losses of any of the RAF’s formations. By the end of the war, Bomber Command had lost 47,268 of its complement on operations, representing over two thirds of all RAF fatal casualties.⁶⁸ Of this number, 9,919 were RCAF aircrew serving in Bomber

66 This section of the paper is based on Allan English, “Leadership and Lack of Moral Fibre in Bomber Command 1939-1945: Lessons for Today and Tomorrow,” in Howard Coombs, ed., *Historical Perspectives of Mutiny and Disobedience, Vol. 3, 1939 to Present*, (Kingston, ON: Canadian Defence Academy Press, in press).

67 John Terraine, *The Right of the Line* (London: Hodder and Stoughton, 1985), footnote 18, 765.

68 Ibid., 682.

Command.⁶⁹ This figure accounts for more than one half of the total of RCAF personnel killed in the Second World War, and about one fifth of the fatal casualties suffered by all Canadian forces in that conflict. From an individual's perspective, even though operational tour lengths were designed to give aircrew a 50-50 chance of survival, in reality losses were often higher, and, at times, as many as 75 percent of the bomber crews perished.⁷⁰ Because lessons about human behaviour and leadership were acquired at a terrible price in both world wars, it behoves us to make use of information gained at such a cost. Therefore, I will conclude by highlighting some of the conclusions of this analysis which may be of use to today's air force leaders.

As we have seen above, the example of 76 Squadron showed that with good leadership, crews could be inspired to accomplish their missions in the face of overwhelming odds against survival. But no matter how inspirational the leadership, there was a limit to what anyone could endure. Until operational tour limits were introduced, as one Bomber Command Senior Medical Officer (MO) remarked, "Flying personnel used to say that they flew till it was 'coffin or crackers.'" ⁷¹ In other words, they flew, without hope of survival, until they were killed or went mad.

Senior leaders in Bomber Command acknowledged that, under these circumstances, everyone had the "wind-up," but that training, discipline, morale, and confidence in equipment, as well as good leadership, allowed most aircrew to overcome their fears. Squadron commanders knew that operational conditions, especially bad flying weather and improving enemy defences, contributed to stress. However, they believed some factors were controllable, and they specifically underscored the disastrous effects upon morale of repeated cancellations of missions, especially late cancellations. From a morale point of view they felt that it was better to go on a sortie in bad weather than to cancel late. The instance of one "freshman" was cited who "scrubbed" 17 times before his first trip; when he finally got to fly on ops, he quit after three trips. Some sympathy was expressed for this pilot, as he had endured as much stress, before he got airborne against a real target, as someone who had gone on many sorties.⁷²

These issues were a source of great concern to senior RAF officers, and, in 1942, the senior RAF consultant in neuropsychiatry, Group Captain (later Air Vice-Marshal) Charles P. Symonds was asked to enquire into the relationship between leadership and psychological disorders in Bomber Command fliers. After interviewing 44 aircrew, mostly station, squadron, and flight commanders, and 37 Bomber Command MOs, Symonds concluded that good leadership was "vital" to helping men "accept and carry the load of operational flying." While there did not appear to be any one type of personality that ensured good leadership,⁷³ Symonds identified a number of characteristics and behaviours that were displayed by successful leaders. He observed that the first task of the good leader, who was

69 Charles Webster and Noble Frankland, *The Strategic Air Offensive Against Germany 1939-1945*, Vol. 4 (London: HMSO, 1961), 440. This number does not include Canadians serving with the RAF.

70 Terraine, *The Right of the Line*, 522; and Air Vice-Marshal D.C.T. Bennett, Leader of the Pathfinders, in Walter Thompson, *Lancaster to Berlin* (Toronto: Totem Books, 1987), foreword, [no page number].

71 Symonds and Williams, "Personal Investigation of Psychological Disorders in Flying Personnel, Section 2," FPRC Report 412 (f), August 1942, in Air Ministry, *Psychological Disorders in Flying Personnel of the RAF*, 19.

72 This effect had been noted in early 1940 by flying personnel Medical Officers in Fighter and Coastal Commands. Being on standby could generate 25-80 percent as much stress as actual combat flying. This created so much fatigue that there were "several cases of pilots falling asleep in the air," H.W. Corner, "Flying Duties at a Fighter Squadron," FPRC Report 122, 24 March 1940, PRO AIR 57, 1-2.

73 Hastings, *Bomber Command*, 159-60; and interview with Donald M. Schurman, who served in Bomber Command, Kingston, 17 December 1992. Schurman added that COs who attempted to minimize losses "one way or another" were respected by their squadrons.

new to a squadron, was to establish his flying expertise. If he had no operational experience in Bomber Command, he had to demonstrate that he was “an efficient operational pilot” as soon as possible. While he was proving his proficiency to the squadron it was also important that he shared its risks by going on “difficult raids,” especially “when losses [were] heavy or morale low.” On ops, crews wanted their CO to set an example of steadiness under pressure. Subordinates, like superiors, also appreciated a keen commander who displayed initiative and drive. They wanted to believe that a CO’s “whole interest” was in the squadron. This would be demonstrated by “a personal knowledge of all the crews,” and by being accessible to them when required. However, aircrew expected a CO to be hard but fair “in all matters” of flying and duty. Above all, he had to be *perceived* to be a leader by his followers, and it was recognized that even a “very good pilot may be a bad leader.” To foster a perception of good leadership a CO was expected, particularly “when things [were] going badly,” or after “very heavy casualties” to be active, organizing “intensive training.” Speaking “quietly and with confidence” and taking a trip when the squadron had a run of poor luck further built an image of the concerned, effective leader.⁷⁴

While it is important to capture and describe air force leadership experiences, using theoretical models to analyze them can provide us with lessons that can be applied to current and future air force leadership challenges. The next part of this chapter gives a brief example of how relevant experience can be analyzed so that appropriate lessons from past operations can be used to better prepare air force personnel for leadership roles.

Applying the Theory. The first scientific study of wartime RAF leadership, by Symonds and his colleague Denis Williams, highlighted three main leadership lessons found in their research and in the examples of leadership given in this chapter: (1) no one type of personality ensured good leadership, but good leaders behaved in certain ways; (2) before a new squadron commander could be an effective leader he had to first of all demonstrate his operational flying ability; and (3) leaders had to share the risks with their subordinates by going on “difficult raids,” especially “when losses [were] heavy or morale low.” The importance of leadership, according to this study, was such that “the fortunes of the squadron” were often described in terms of its COs. One station commander remarked that cases of lack of confidence in leaders “usually occur in epidemics, and when an epidemic occurs it is usually due to a bad squadron or flight commander.” In one case, when “it became known that a squadron commander wouldn’t fly operationally,” five cases of lack of moral fibre (LMF) occurred in the first fortnight. Men cracked “because they had no confidence” in their leaders.⁷⁵

In summary, the air force leadership experiences and research described in this chapter tells us that good aircrew leaders should exhibit above average flying skills, and can, to a certain extent, be trained and educated to display those behaviours that inspire confidence in their subordinates. Using leadership theories such as those described in *Conceptual Foundations*, allows us to conduct a more rigorous analysis of air force leadership than Symonds and Williams could conduct. For example, while position power may be the foundation of military leadership, air force leaders must develop personal power bases to be effective.⁷⁶ In the case of Lanoe Hawker in the First World War and Bomber Command leaders in the Second World War, expert power was required to have credibility as a leader and referent power was necessary to get followers to accomplish their missions, especially

74 Symonds and Williams, “Personal Investigation of Psychological Disorders in Flying Personnel of Bomber Command,” FPRC Report 412 (f), August 1942, in Air Ministry, *Psychological Disorders in Flying Personnel of the RAF*, 32, 53.

75 Allan English, *Cream of the Crop*, 93-7. Quotes from C.P. Symonds and Denis Williams, “Personal Investigation of Psychological Disorders in Flying Personnel of Bomber Command,” FPRC Report 412 (f), August 1942, in Air Ministry, *Psychological Disorders in Flying Personnel of the RAF* Air Publication 3139, (London: HMSO, 1947), 53-4.

76 See *Conceptual Foundations*, 58-60 for a description of leader power.

when casualty rates were high and chances of survival for crews were low. This ties in with the idea that air force leaders must be capable of exercising technical leadership, based on the specialized knowledge or skill of the leader, as described above. A key leader behaviour required to establish referent power in the examples above was for leaders to share the risks with their subordinates by being among the first to fly when there were doubts about the safety of equipment or going on dangerous missions when heavy casualties were anticipated. It is noteworthy that squadron COs or other senior leaders were not expected to lead all missions, but that they were expected to share the risks with their subordinates from time to time. This sharing of risks with subordinates was critical to building subordinates' trust and commitment both of which were fundamental to the transformational leadership style used by successful air force leaders in both World Wars.

These leadership experiences could also be analyzed in terms of leading people or getting the job done (Hawker and Iveson) and leading the institution, or setting the conditions for mission success (Harris), focussing on the types of leadership competencies and skills that were most relevant in each case.⁷⁷

Addressing the Problem

This chapter has provided an overview of certain aspects of Canadian Air Force leadership and attempted to put it in its historical and contemporary context. The discussion in this chapter has also tried to show how current leadership theories, as reflected in CF leadership doctrine, can be applied to Air Force leadership experiences. It is worth emphasizing here that with the recent publication of CF doctrine on the profession of arms and leadership as well as the work of Pigeau and McCann on the human dimension of command, Canada is at the forefront of the development of leadership and command theories and models that can be applied to the practice of the profession of arms.

However, the publication of theories and doctrine is only the first step in improving Air Force leadership development. A complementary step is the analysis of historical experience and recent operations so that relevant lessons can be identified and disseminated through the CF and Air Force PME systems. Analysis can also guide further research and lead to the modification of current theories and doctrine or the creation of new theories and doctrine. Until now, the lack of rigorous analysis of historical experience and recent operations to distil leadership lessons learned has handicapped the Air Force's leadership development programs. With the creation of the Aerospace Warfare Centre, it is hoped that the Air Force, in partnership with others, will be able to remedy these problems.

There are, however, a number of specific gaps in our knowledge that are apparent and that need to be explored. For the purposes of this project, these are some of the key research questions that should be addressed:

- a. What are the leadership differences by air force community, e.g., among aircrew vs maintenance vs support?
- b. What are the leadership differences in expeditionary vs other types of operations?
- c. How does diversity in air force teams affect the effectiveness of various leadership behaviours?
- d. What are the implications of the unique characteristics of air force leadership for joint/integrated operations?

⁷⁷ See *Conceptual Foundations*, 48 for an overview of this approach.

The Air Force needs to begin a serious and rigorous analysis of its leadership based on, among other things, historical experience and recent operations as well as the research questions listed here in order to address the “profound lack of effective leadership” in some parts of the Air Force. These questions are offered as a way of framing some of that research.

Chapter 6

Command and the Canadian Air Force

Part 1 – Introduction

Overview. Command has been one of the most contentious, yet one of the least studied, issues throughout the history of Canada's air forces. In both World Wars the vast majority of Canadian air force commanders who commanded during operations did so at the tactical level.¹ A very few senior officers commanded at what might be described as the operational level, notably in No. 6 Group, RAF Bomber Command, but even these officers commanded at a very low operational level, at best. In the Second World War, the RCAF created a massive training organization as part of the BCATP in Canada, but, unlike the RAF Canada in the First World War, Canadians filled most of the command positions in this training organization. Nevertheless, the Official History of the RCAF noted that Air Force Headquarters was at times "out of its depth" because RCAF officers who rose to senior rank in the Second World War "had not been properly prepared to organize, control, supply, and direct a large air force."² While most senior RCAF officers in Canada exercised largely administrative command in an extensive training organization, a few exercised operational-level command in the North American theatre, notably in Eastern Air Command. However, as we have seen, some of those commanding Eastern Air Command were judged by the official historians of the RCAF to have inadequate leadership skills. By the end of the war, many Canadian senior officers had acquired command experience, but, as noted by C.P. Stacey, Canada's pre-eminent military historian, wartime policies "'broke the back' of the RCAF" and prevented it from fielding a "national air force" with the same higher command opportunities as those enjoyed by the Canadian Army.³ The RCAF's problem of lack of higher command experience in the Second World War has parallels to the situation now being faced by the Canadian Air Force where, since the disbandment of the functional groups in 1997, there are very few command positions for Air Force general officers.⁴

The Cold War saw the RCAF rise from the ashes of the Second World War demobilization to become, from the 1950s until its disbandment in 1968, a large air force focused on conducting operations. The command issues of this era were briefly described in Chapter 3, but this is an era that requires much more research to fully understand how the RCAF, for the first time in its history, created a large operational, as well as administrative, command structure. Even though the unified CF adopted many of the RCAF's command models in 1968, splitting Canada's air forces among various organizations with no central body to provide a focus for all air operations and doctrine had serious repercussions for air force command and control and leadership.⁵ The current situation where the Air Force command structure is the result of a series of ad hoc re-organizations, driven by budget cuts and force

1 A description of the relationship of major leadership functions to levels of conflict and command can be found in *Conceptual Foundations*, 11-12.

2 W.A.B. Douglas, *The Official History of the Royal Canadian Air Force. Vol. 2: The Creation of a National Air Force* (Toronto: Univ. of Toronto Press, 1986), 372.

3 C.P. Stacey, *A Date with History*. Ottawa: Deneau, [1982?], 257.

4 These issues are discussed in more detail in Major Anne Loesch, et al., "The Development of Air Force Operational Commanders," in Douglas L. Erlandson and Allan English, eds., *Air Force Command and Control* (Toronto: Canadian Forces College, 2002, 40-1.

5 As explained in the previous chapter, the usage of the terms "leadership" and "command" here reflects the inter-relationships and interconnectedness of these terms, as explained in *Conceptual Foundations*, 10.

reduction targets, is a direct outcome of this dispersion of Canada's air forces. Even the formation of Air Command in 1975 was unable to provide a solution to this problem, as staff responsibilities were split between Winnipeg and Ottawa, a situation that continues to this day. Without coherent Air Force doctrine above the tactical level, particularly doctrine related to command and control, expediency has been the driving principle behind most changes to the structure of Canada's Air Force at the end of the 20th and the beginning of the 21st century. This has led to piecemeal, often dysfunctional, C² arrangements that continue to afflict the Canadian Air Force to this day.

One of the consequences of the Canadian Air Force's lack of adequate command and control doctrine is that, even though the C² arrangements used by armies, navies and air forces are different and are strongly influenced by the physical and cultural settings in which they operate, army concepts of C² dominate in the CF. Armies usually function in the most complex and chaotic operating environment, and, therefore Western armies have, for the most part adopted the doctrine of mission command so that decisions can, in theory, be taken by those closest to the situation, often down to the level of the individual soldier. Air forces, on the other hand, operate in the least cluttered battlespace. In this environment, both command-by-direction and command-by-plan (described below) are possible, and they are effective command styles given the nature of modern air warfare. Navies operate in an environment of medium complexity, compared to air forces and armies, and, therefore most Western navies in the Anglo-American command tradition have identified the need for a command and control system to effectively coordinate maritime operations in a relatively complex, multi-threat environment, over a wide area. Within the naval framework, although individuals are connected via their consoles, they operate as elements of larger systems, such as the various ships' operations rooms (at the lowest level) within the fleet framework. Based on these operational realities, the Canadian Navy and some other navies in the Anglo-American command tradition are implementing a unique naval mission command style. Unlike the army model where command is delegated down to the lowest possible levels, naval mission command might extend down only to the captain of a vessel and a very few specially delegated principal officers.

Despite these environmental differences in command, the official CF leadership philosophy reflects the army version of mission command.⁶ While it is possible that certain aspects of this philosophy of mission command are appropriate for use by air force leaders, it is also true that other aspects are not. And yet, as noted in the previous chapter, while recognizing that air forces may have different leadership (and command) requirements, CF doctrine does not discuss these differences. Since a "one size fits all" approach to command (and leadership) does not work in today's varied operating environments, it is incumbent upon the Air Force to clearly articulate its command philosophy.⁷ This chapter aims to make a contribution to this process.

As we saw in the chapter on leadership, Canada is at the forefront of some areas in the development of leadership and command theories and models that can be applied to the practice of the profession of arms. And yet the theoretical study of command in a military

6 *Conceptual Foundations*, 122-7, and Glossary "mission command," p. 131. Note that both examples given in *Conceptual Foundations* are from the land environment.

7 During the recent CF transformation initiatives, it appears that some senior Army officers proposed splitting Air Force resources up among various regional Joint Force Commands. This proposal reflects a profound ignorance of almost a century of experience in the C² of air forces, and may be attributable to the inability of the Air Force to clearly articulate its C² philosophy.

context has been described as “immature.”⁸ If this is the case, then the theoretical study of command in a Canadian Air Force context could be described as “embryonic.” Chapters 2–4 of this book have tried to give readers a sense how historical experience has shaped air force command arrangements in the Canadian context. This chapter will examine some of the key issues raised in the embryonic literature on Canadian air force command. The next part of this chapter puts air force command in a historical and theoretical context. The third part examines air force command in a 21st century context focusing on the concept of command of the Canadian Air Force during expeditionary operations. The fourth part of this chapter discusses evolving C² concepts that have the greatest relevance for air force operations, especially networked operations, effects based operations and centralized command and decentralized execution. The chapter concludes by discussing key issues in air force command and leadership and then looking at the future of Canadian Air Force command and control by identifying key problems and by suggesting ways to address these problems.

Part 2 – The Historical and Theoretical Context

The Origins of Some Terms Related to Command and Control

Background. Most of the formal definitions related to C² in current military doctrine and usage (see Glossary) date from the Second World War, and reflect the outcome of negotiations among the Allies, particularly the US and Britain, over how terms like “command,” “control,” “unity of command,” and “co-ordination” should be used to ensure the effective employment of forces in joint and combined operations in that war. Therefore, a brief outline of how some of these terms came to be defined is offered to provide the reader with the context necessary to understand current issues in command and control terminology.

At the beginning of the Second World War, the Canadian Army, Navy and Air Force feared being dominated by other services, both Canadian or foreign, and, therefore they “jealously guarded their independence.”⁹ Each service was opposed to any kind of centralization of command and control, and they insisted “on mutual and voluntary cooperation as the only basis for joint planning and command.”¹⁰ Co-operation, then, became the main command and control principle amongst the Canadian services, and it entailed working “together for mutually agreed goals.”¹¹

Unity of Command or Operational Command. The creation of formal defensive arrangements between Canada and United States, with the establishment of the Permanent Joint Board on Defence in August 1940, brought a new and unfamiliar command and control term to the attention of Canada’s armed forces: unity of command. This principle, Canadian historian W.A.B. Douglas has noted, “was alien to Canadian doctrine and practice.”¹² Nonetheless, this command and control principle was deeply entrenched in the United States Army and Navy. Unity of command essentially meant having one

8 Ross Pigeau and Carol McCann, “Re-conceptualizing Command and Control,” *Canadian Military Journal* 3, no. 1 (Spring 2002), 53.

9 Roger Sarty, *The Maritime Defence of Canada* (Toronto: The Canadian Institute of Strategic Studies, 1996), 206.

10 M.V. Bezeau, “The Role and Organization of Canadian Military Staffs,” unpublished MA thesis, Royal Military College of Canada, 1978, 68.

11 Bezeau, “Role and Organization,” 156. The Canadian government was also wary of the Canadian Armed Forces coming under foreign command. Early in the war, Prime Minister William Lyon Mackenzie King officially established co-operation as the primary command and control principle upon which Canadian Armed Forces operations were to be based. Order-in-Council by the Canadian Government, 17 November 1939, reproduced in David R. Murray, ed., *Documents on Canadian External Relations, Volume 7, 1939-1941, Part I* (Ottawa: Information Canada, 1974), 842.

12 W.A.B. Douglas, *The Creation of a National Air Force: The Official History of the Royal Canadian Air Force Volume II* (Toronto: University of Toronto Press and the Department of National Defence, 1986), 382.

commander—from any service—to command the air, ground, and naval forces in a theatre of operations. This “single authority” would be able to choose between strategic plans, resolve the conflicting claims of feuding officers for resources, and assign operational priorities. The principle of unity of command aimed to avoid duplication of effort and competition for resources among co-equal commanders and could be summarized by the adage that “too many cooks ruin the soup.” This principle also prescribed the establishment of a clear chain of command to minimize delays in issuing orders.¹³ Notably, unity of command is the very command and control principle upon which the new CF “Canada Command,” and other new commands established on 1 February 2006, are based.¹⁴ This recent command-centric re-organization of the CF is designed to replace the convoluted management-based matrix organization of the CF that was described in Chapter 4

An official definition of unity of command appeared in the 1941 Joint Canadian-United States Basic Defence Plan No. 2 (Short Title ABC-22):

Unity of command, when established, vests in one commander the responsibility and authority to co-ordinate the operations of the participating forces of both nations by the setting up of task forces, the assignment of tasks, the designation of objectives, and the exercise of such co-ordinating control as the commander deems necessary to ensure the success of the operations. Unity of command does not authorize a commander exercising it to control the administration and discipline of the forces of the nation of which he is not an officer, nor to issue any instructions to such forces beyond those necessary for effective co-ordination.¹⁵

This 1941 definition of unity of command closely resembles today’s modern definition of the term “operational command.”¹⁶ Therefore, during the Second World

13 Forrest C. Pogue, *The Supreme Command: The European Theater of Operations, United States Army in World War II* (Washington: Office of the Chief of Military History, Department of the Army, 1954), 41; Louis Morton, *Strategy and Command: The First Two Years: The War in the Pacific, United States Army in World War II* (Washington: Office of the Chief of Military History, Department of the Army, 1962), 250. Another analogy is that unity of command avoids having “a ship with several captains.” Memorandum from Newfoundland Commissioner for Justice and Defence to Commission of Government of Newfoundland, 14 January 1942, reproduced in Paul Bridle, ed., *Documents on Relations Between Canada and Newfoundland Volume I: 1935-1949* (Ottawa: Information Canada, 1974), 916-918.

14 “Backgrounder: Canada Command,” DND News Room, BG-05.017, 28 June 2005, www.forces.gc.ca/site/Newsroom/view_news_e.asp?id=1692. Accessed 30 June 2005; James Gordon, “Military rolls out Canada Command to organize Forces,” *Ottawa Citizen*, 29 June 2005.

15 Joint Canadian-United States Basic Defence Plan No. 2 (Short Title ABC-22), 28 July 1941, reproduced in Paul Bridle, ed., *Documents on Relations between Canada and Newfoundland Volume I: 1935-1949* (Ottawa: Information Canada, 1974), 894-899.

16 The similarities between the two definitions are indicated as follows (similarities are bolded and numbered for easier comparison):

Canadian Forces Operations definition of “Operational Command”:

The **authority [2]** granted to a **commander [1]** to **assign missions or tasks [3]** to subordinate commanders, to deploy units, to reassign forces and to **retain or delegate OPCON [operational control] and/or tactical control (TACON) as may be deemed necessary [4]**. It **does not of itself include responsibility for administration or logistics [5]**.

ABC-22’s definition of “Unity of Command”:

Unity of command, when established, vests in **one commander [1]** the **responsibility and authority [2]** to co-ordinate the operations of the participating forces of both nations by the setting up of task forces, the **assignment of tasks [3]**, the designation of objectives, and **the exercise of such co-ordinating control as the commander deems necessary [4]** to ensure the success of the operations. Unity of command **does not authorize a commander exercising it to control the administration and discipline [5]** of the forces of the nation of which he is not an officer, nor to issue any instructions to such forces beyond those necessary for effective co-ordination.

Sources: *Canadian Forces Operations*, B-GJ-005-300/FP-000, Chapter 2, Section I, Subsection 202.2b; and ABC-22 Agreement, 28 July 1941, reproduced in Bridle, ed., *Documents*, 896.

War unity of command implied vesting operational command of multi-service forces in a single commander.¹⁷

Operational Control. The term “operational control” was first used by Royal Navy in 1941 as a means to increase its influence over Royal Air Force Coastal Command maritime patrol operations. However, because it was not precisely defined at first, operational control proved to be an ambiguous command and control principle. The March 1941 “Coastal Command Charter” stipulated that “operational control of Coastal Command will be exercised by the Admiralty through the Air Officer Commanding-in-Chief (C-in-C), Coastal Command.”¹⁸ It did not, however, exactly define what “operational control” actually entailed. The naval C-in-C only had the authority to issue “general directives” as to the objectives to be obtained; it was the air commander who actually exercised “operational control” by “delegat[ing] the day-to-day detailed conduct of air operations.”¹⁹ The C-in-C of Coastal Command, Air Marshal Sir John Slessor, perhaps put the command and control relationship best: “the sailor tells us the effect he wants achieved and leaves it entirely to us how that result is achieved.”²⁰ It was therefore not surprising that the RAF felt that the Admiralty’s “operational control” over Coastal Command was a “polite myth.”²¹

While the British continued to tolerate ambiguity on this issue, the Americans did not. At the end of May 1941, they revealed their definition of operational control to their Canadian counterparts on the Permanent Joint Board on Defence: “Operational control includes the responsibility and authority to dispose and employ available means to require such action by all available forces as will most effectively execute the assigned task.”²² This definition was more precise than the British one, and in late 1943, under American pressure, the RN and RAF—after some disagreement²³—finally agreed on a clear definition of operational control:

Operational Control comprises those functions of Command involving composition of Task Forces or Groups or Units, assignment of Tasks, designation [sic] of objectives and co-ordination necessary to accomplish the Mission. It shall always be exercised where possible by making use of normal organisation Units assigned, through the responsible Commanders. It does not include such matters as Administration, discipline, Internal Organisation and training of Units... It is recognised that the Operational Authority

17 Stanley W. Dziuban, *United States Army in World War II Special Studies: Military Relations Between the United States and Canada, 1939-1945*, (Washington: Office of the Chief of Military History, Department of the Army, 1959), 110, 141.

18 Committee on Coastal Command Report, 19 March 1941, British National Archives (formerly Public Records Office [hereafter PRO]), Air Ministry file [hereafter Air] 15/338.

19 Committee on Coastal Command Report, 19 March 1941, 15/338; and Directorate of History and Heritage, Department of National Defence [hereafter DHH] file 79/599, Captain D.V. Peyton-Ward, *The RAF in the Maritime War, Volume II: The Atlantic and Home Waters: September 1939-June 1940* (RAF Air Historical Branch Narrative), nd, 275, 286.

20 Air Marshal J. Slessor to Air Vice-Marshal N.R. Anderson, 24 June 1943, DHH 181.009 (D6734). This was not unlike the RN’s understanding of the relationship: “the naval Commander-in-Chief stated his requirements for protection, escorts or patrols and the Air Officer Commanding the Coastal Command Group then issued his orders to meet the Naval requirements.” S.W. Roskill, *The War At Sea, 1939-1945: Volume 1: The Defensive* (London: HMSO, 1954) 361.

21 Sir John Slessor, *The Central Blue: Recollections and Reflections* (London: Cassel and Company Limited, 1956), 482. The Chief of the Air Staff, Air Chief Marshal Sir Charles Portal, felt that the provision in the Coastal Command Charter was “a rather meaningless formula and that, in fact, you [CinC Coastal Command] exercise operational control in their interests.” Air Chief Marshal C. Portal to Air Chief Marshal P. Joubert de la Ferté, 11 June 1942, Portal Papers, Folder 8A, DHH 87/89.

22 Memorandum from Assistant Chief of the General Staff to the Chief of the General Staff, 31 May 1941, reproduced in David R. Murray, ed., *Documents on Canadian External Relations, Volume 8, 1939-1941, Part II* (Ottawa: Information Canada, 1976), 219.

23 See correspondence between the RAF and the RN from October 1943 to January 1944 in Air 15/339.

may in emergency or unusual situations employ assigned Units on any task that he considers essential to effective execution of his operational responsibility.²⁴

This definition mirrors very closely the modern definition of operational control. Indeed, this 1944 definition proved to be of great importance, for operational control became the cornerstone command and control principle of the two key post-war military alliances, NATO and NORAD.²⁵

Operational Direction. In early 1943, the Western Allies established the Canadian Northwest Atlantic Command, and granted Rear-Admiral L.W. Murray, the Royal Canadian Navy C-in-C in Halifax, “operational direction” over all maritime patrol forces in the new theatre of operations.²⁶ The problem for Murray was that operational direction was not specifically defined when the new Command was stood up on 30 April 1943. Therefore, when Murray began, in the RCAF’s opinion, to exert too much influence on maritime patrol operations, the RCAF sought advice from RAF Coastal Command.²⁷ Air Marshal Slessor stressed that Murray was exceeding his authority by giving specific detailed instructions for maritime patrol operations. Instead, Slessor indicated that:

...what he should tell us is that he wants that convoy protected; and he should give us an order of priority for the convoy; and he should tell us whether in his view, convoy protection at any given place or time should have priority over offensive sweeps; but how you protect [the] convoy is entirely a matter for Johnson [Air Officer Commanding-in-Chief Eastern Air Command].²⁸

To paraphrase, then, operational direction was the authority to issue directives as to the objectives to be pursued (i.e., the effect that one wanted to achieve) in operations. It did not include the planning and issuing of detailed instructions for the actual execution of operations, as they were a part of operational control. Importantly, this definition of operational direction closely mirrors the relationship between Coastal Command and the Admiralty as indicated in the 1941 Coastal Command Charter (see above). Therefore, one could argue that the Admiralty had “operational direction” not “operational control” over Coastal Command operations.²⁹

Implications of Second World War Experience for Today. Many principles of operational-level command and control evolved significantly during the Second World War. And the definitions of a number of command and control terms forged during this conflict provided precedents for future command and control principles both during the

24 Commander-in-Chief U.S. Navy to USN Commands, Admiralty, Air Ministry and COS Army, 11 February 1944, PRO, Air 15/339.

25 Joseph Jockel, *No Boundaries Upstairs: Canada, the United States and the Origins of North American Air Defence, 1945-1958*, (Vancouver: University of British Columbia Press, 1987), 105; Raymont Collecton, DHH 73/1223, files 84 to 99.

26 The Royal Canadian Air Force commander in Halifax (Air Officer Commanding-in-Chief Eastern Air Command) was granted operational control over all maritime patrol assets in the new command, while the RCAF’s Air Officer Commanding No. 1 Group exercised local operational control over maritime aircraft based in Newfoundland. This included a large number of American aircraft. Report of Sub-Committee on Command Relations, Atlantic Convoy Conference Minutes, DHH 181.003 (D5027).

27 Commander-in-Chief Canadian Northwest Atlantic to Air Officer Commanding-in-Chief Eastern Air Command, 5 May 1943, DHH 118.002 (D122); Group Captain P.F. Canning to Air Marshal J. Slessor, 27 May 1943, Air 2/8400; Slessor to Portal, 1 June 1943, Portal to Slessor, 1 June 1934, and Slessor to Portal, 3 June, Portal Papers, Folder 8A, DHH 87/89.

28 Slessor to Anderson, 24 June 1943, DHH 181.009 (D6734). Underline in original.

29 Richard Evan Goette, “The Struggle for a Joint Command and Control System in the Northwest Atlantic Theatre of Operations: A Study of the RCAF and RCN Trade Defence Efforts During the Battle of the Atlantic,” unpublished MA thesis, Queen’s University, 2002, 43.

Cold War and today. It must be emphasized, however, that the focus of the command and control principles and terms discussed above was at the operational level of war. If there is a theme that is consistent with all of these definitions, it is that none of these command and control principles granted a commander authority over another service's administration and discipline. This authority instead fell to the command that the service itself exercised through the head of that service (Chief of Air Staff, Chief of the Naval/Maritime Staff, Chief of the General/Land Staff, etc.), a practice that continues to this day.

Since the end of the Cold War, the predominance of *ad hoc* "coalitions of the willing" in many military operations has led some to suggest that C² in coalition operations should be re-defined as "cooperation and coordination," since this expression reflects the reality of C² in these operations today rather than "command and control" derived from more rigid Cold War C² arrangements.³⁰ Moreover, this new paradigm of "cooperation and coordination" appears to emphasize leadership or influence behaviours among peers over traditional concepts of command involving the exercise of authority over subordinates. Therefore, in coalition operations the leadership concepts of emergent leadership and distributed leadership may be more useful than concepts of authority. In fact one might see the high reputation that senior Canadian naval officers have earned in certain command positions as a type of emergent leadership based on three subclasses of personal power (i.e., expert, referent, and connection), rather than position power.³¹ Likewise, these leadership behaviours have stereotypically been attributed to air force leaders, and it is appropriate, therefore, that the Canadian Air Force become involved in research into the "new C²."

These recent developments in C² practice remind us of the necessity to remain conceptually flexible when discussing issues related to command. The reappearance of terms like "cooperation and coordination" in the C² lexicon also serve to remind us that past experience and historical accounts of the evolution of C² can provide us with valuable insights that can aid us in understanding the continuing evolution of command concepts. The next section of this chapter examines the continuing evolution of ways of thinking about C².

New Ways of Thinking about Command, Control, and C² ³²

The problems with current formal doctrinal definitions of terms like "command," "control," and "command and control" (see Glossary) stem from the historical roots described above and also from the fact that many current doctrinal definitions, particularly those used by NATO, are the result of negotiation and compromise and not theory or research. Many contemporary problems with air force command are directly related to these circumstances. The description of how the common usage of these terms has led to confusion in both the study and the application of C² is described best by Pigeau and McCann:

These terms ["command," "control," and "command and control"] are recognizably military, and are well-entrenched in the military's doctrinal and operational vocabulary. Yet the manner in which these terms are used, as well as the circumstances of their usage, varies with confusing complexity. For example, some branches of the military endorse the concept of mission command, others endorse a philosophy of

30 See Allan English, Richard Gimblett, and Howard Coombs, "Beware of Putting the Cart before the Horse: Network Enabled Operations as a Canadian Approach to Transformation," DRDC Toronto, Contract Report CR 2005-212 (19 July 2005), 30-8 for a more detailed discussion of this issue.

31 See Allan English, et al., "Command Styles in the Canadian Navy," 95-111, for a discussion of these leadership styles in a Canadian naval context.

32 This part of the chapter is based on Allan English, Richard Gimblett, and Howard Coombs, "Beware of Putting the Cart before the Horse: Network Enabled Operations as a Canadian Approach to Transformation," DRDC Toronto, Contract Report CR 2005-212 (19 July 2005), 11-19.

centralized control and decentralized execution, while in other services the notion of network-centric C² is prominent. NATO employs a dizzying array of C² nomenclature and authorities: OPCON, TACOM, full command, etc. And if we look for help from official definitions of Command, Control and C² (e.g., those of NATO), we find that the definitions themselves are circular and redundant. The command definition makes use of the word control, the control definition uses concepts that are part of the definition of command, and the definition of C² is merely a longer restatement of the definition of control. Add to this confusion the growing and bewildering array of C² acronyms adopted by militaries around the world (e.g., C2I, C3I2, C4ISRW, etc.), and it is no wonder that defence analyst Greg Foster has described the state of Command and Control theory as bleak, using words like “inchoate,” “diffuse,” “conjectural” and “seemingly random.”³³

In an attempt to put some order into the discussion of C², this part of the chapter will give an overview of some of the main theoretical and practical issues related to command at the operational level, relying on two frameworks. The first was devised by Thomas J. Czerwinski who served in the US Marine Corps and US Army and was on the faculty of the National Defense University; the second was put forward by Canadian researchers Ross Pigeau and Carol McCann of Defence Research and Development Canada – Toronto. Both frameworks are cited frequently in the literature on C². The Pigeau-McCann framework is emphasized here because it is one of the leading empirically-based models of C² currently being developed. Furthermore, as a model being developed by Canadian researchers, using Canadian (as well as other) data, it is compatible with the organizational culture of the CF, and it addresses the major challenges confronting Canadian decision-makers.

The Czerwinski Framework. Czerwinski proposes a framework, based on three types of command style, which summarizes many of the concepts in the current debate. He describes the first command style, used in the US Army’s Force XXI/digitized battlefield concept, as “command-by-direction.” This form of command has been used since the beginning of organized warfare, and it is based on commanders attempting to direct all of their forces all of the time. This form of command fell into disfavour in the middle of the 18th century as the increase in the size of armed forces made it increasingly difficult to exercise. Czerwinski argues that “command-by-direction” has been resurrected by the US Army because it believes that technology can provide the commander with the ability to exercise this type of command again; however, he asserts that, because of the size and complexity of the technical support required to support this command style, it will be inadequate and self-defeating if applied to 21st century conflict.

Czerwinski’s second style, “command-by-plan,” was created by Frederick the Great 250 years ago to overcome the limitations of “command-by-direction.” “Command-by-plan” emphasizes adherence to a pre-determined design and it has evolved as the norm for many modern military forces in the West. The US Air Force’s air campaign doctrine is cited as an example of this type of command system which is characterized by trading flexibility for focus in order to concentrate on identifying and neutralizing an opponent’s centres of gravity. Czerwinski claims that “command-by-plan” is useful only at the strategic and operational levels of war, but if too much emphasis is put on adhering to the plan, this method will be ineffective because of its inability to cope with unforeseen or rapid change.

33 Ross Pigeau and Carol McCann, “Re-conceptualizing Command and Control,” *Canadian Military Journal* 3, no. 1 (Spring 2002), 53.

Czerwinski advocates the adoption of a third type of style, “command-by-influence,” to deal with the chaos of war and the complexity of modern operations. This command style attempts to deal with uncertainty by moving decision thresholds to lower command levels, thereby allowing smaller units to carry out missions bounded by the concept of operations derived from the commander’s intent. The emphasis in this method of command is on training and educating troops to have the ability to exercise initiative and to exploit opportunities guided by the commander’s intent. Czerwinski’s contention that only “command-by-influence” systems are likely to be consistently successful in the 21st century is supported by a number of military communities, notably the US Marine Corps.³⁴

The Pigeau-McCann Command Framework. Pigeau and McCann devised their framework to address the lacunae in theoretical study of command in a military context and have begun to evaluate their framework based on data gathered from Canadian military operations.³⁵ They note that whether involved in disaster relief, peacekeeping operations or war, the CF deal in human adversity. Inevitably, the CF responds to and resolves this adversity through human intervention. Any new theory of C² must, therefore, assert the fundamental importance of the human as its central philosophical tenet. It is the human—e.g., the CF member—who must assess the situation, devise new solutions, make decisions, co-ordinate resources and effect change. It is the human who must initiate, revise and terminate action. It is the human who must (ultimately) accept responsibility for mission success or failure. All C² systems, from sensors and weapons to organizational structures and chain of command, must exist to support human potential for accomplishing the mission. For example, C² organizations that are intended to allocate authorities and define areas of responsibility should facilitate the co-ordination of human effort to achieve mission objectives. If the organization hinders this goal—for example, by confusing lines of authority or by imposing excessive bureaucracy—then the human potential necessary for accomplishing the mission is also compromised. The challenge, then, becomes one of specifying those aspects of human potential that should guide C² development.

Pigeau and McCann’s framework first distinguishes the concept of command from control, giving pre-eminence to command. They then link the two concepts together in a new definition of C².³⁶

Pigeau and McCann define key terms as follows. Command is “the creative expression of human will necessary to accomplish the mission.” And control is “those structures and processes devised by command to enable it and to manage risk. The function of control is to enable the creative expression of will and to manage the mission problem in order to minimize the risk of not achieving a satisfactory solution. The function of command is to invent novel solutions to mission problems, to provide conditions for starting, changing and terminating control, and to be the source of diligent purposefulness.”³⁷ The functions of command versus control are shown in Table 6.1.

34 Thomas J. Czerwinski, “Command and Control at the Crossroads,” *Parameters* 26, no. 3 (Autumn 1996), 121-32.

35 See for example C. McCann, R. Pigeau and A. English, “Analysing Command Challenges Using the Command and Control Framework: Pilot Study Results,” Technical Report, DRDC-TORONTO # TR-2003-034 (1 Feb 2003), available at pubs.drdc-rddc.gc.ca/BASIS/pcandid/www/engpub/SF. Accessed 29 Nov 2006.

36 This section is excerpted from G.E. Sharpe and Allan English, *Principles for Change in the Post-Cold War Command and Control of the Canadian Forces* (Kingston, ON: Canadian Forces Leadership Institute, 2002), 71-2.

37 Pigeau and McCann, “Re-conceptualizing Command and Control,” 56.

Commanding	Controlling
To create new structures and processes (when necessary)	To monitor structures and processes (once initiated)
To initiate and terminate control	To carry out pre-established procedures
To modify control structures and processes when the situation demands it	To adjust procedures according to pre-established plans

TABLE 6.1. COMMAND AND CONTROL AS ACTIONS³⁸

Their definition of command, markedly different from the standard NATO definition, is: *the creative expression of human will necessary to accomplish the mission*. Without creativity, C² organizations are doomed to applying old solutions to new problems, and military problems are never the same. Furthermore, without human will there is no motivation to find and implement new solutions. For example, rarely does the slavish adherence to rules and procedures (e.g., SOPs), devoid of creativity, produce effective organizations. Indeed, as will be seen elsewhere in this book, navies traditionally have avoided “doctrine” fearing it would restrict the initiative of their captains at sea. And as most labour unions know, a good method for hampering operational effectiveness is to “work to rule” or to follow only “the letter of the law”. Command, therefore, needs a climate of prudent risk taking, one where individuals are allowed to tap inherent values, beliefs and motivations to marshal their considerable creative talents towards achieving common goals.

It follows from their definition that all humans have the potential to command; put another way, that command is an inherently human activity that anyone, if they choose, can express. To limit command only to those individuals who have been bestowed with the title of “Commander,” begs the question of what command is in the first place. Notice that their definition allows even junior NCMs to command. If, through their will, they are creative in solving a problem which furthers the achievement of the mission, then they have satisfied the requirements for command.

But if all humans can command, on what basis do Pigeau and McCann differentiate command capability? What differentiates the private from the general officer? What key factors influence its expression? To address these questions, Pigeau and McCann have further refined the notion of command in proposing the concept of “effective command,” defined as “the creative and purposeful exercise of legitimate authority to accomplish the mission legally, professionally and ethically.”³⁹ This definition highlights the notion of legitimate authority as the basis of effective command in the military. Even though all humans can command, according to their definition of command, the exercise of command by those not in positions of legitimate authority would probably not be deemed effective command in a military context. In this book, the term “command” is used to denote “effective command” using the Pigeau-McCann definition.

Dimensions of Command. To elaborate further on their concept of command, they propose that command capability can be described in terms of three independent dimensions: competency, authority and responsibility (CAR).

Command requires certain competencies so that missions can be accomplished successfully. For most militaries, *physical* competency is the most fundamental, one that is mandatory for

³⁸ Ibid.

³⁹ Ross Pigeau and Carol McCann, “Re-conceptualizing Command and Control,” presentation given to Command and Staff Course 31, Canadian Forces College (CFC), 3 Sep 2004.

any operational task, from conducting a ground reconnaissance, to flying an aircraft. The second skill set, *intellectual* competency, is critical for planning missions, monitoring the situation, for reasoning, making inferences, visualizing the problem space, assessing risks and making judgements. Missions, especially peace support missions, can be ill-defined, operationally uncertain, and involve high risk. Command under these conditions requires significant *emotional* competency, a competency strongly associated with resilience, hardiness and the ability to cope under stress. Command demands a degree of emotional “toughness” to accept the potentially dire consequences of operational decisions. Finally, *interpersonal* competency is essential for interacting effectively with one’s subordinates, peers, superiors, the media and other government organizations. These four aspects describe the broad set of competencies necessary for command.

Authority, the second dimension of command, refers to command’s domain of influence. It is the degree to which a commander is empowered to act, the scope of this power and the resources available for enacting his or her will. Pigeau and McCann distinguish between the command authority that is assigned from external sources and that which an individual earns by virtue of personal credibility—that is, between legal authority and personal authority. Legal authority is the power to act as assigned by a formal agency outside the military, typically a government. It explicitly gives commanders resources and personnel for accomplishing the mission. The legal authority assigned to a nation’s military goes well beyond that of any other private or government organization; it includes the use of controlled violence. Personal authority, on the other hand, is that authority given informally to an individual by peers and subordinates. Unlike legal authority which is made explicit through legal documentation, personal authority is held tacitly. It is earned over time through reputation, experience, strength of character and personal example. Personal authority cannot be formally designated, and it cannot be enshrined in rules and regulations. It emerges when an individual possesses the combination of competencies that yields leadership behaviour.

The third dimension of command is responsibility. This dimension addresses the degree to which an individual accepts the legal and moral liability commensurate with command. As with authority, there are two components to responsibility, one externally imposed, and the other internally generated. The first, called extrinsic responsibility, involves the obligation for public accountability. When a military commander is given legal authority, there is a formal expectation by superiors that he or she can be held accountable for resources assigned. Extrinsic responsibility taps a person’s willingness to be held accountable for resources. Intrinsic responsibility, the second component of responsibility, is the degree of self-generated obligation that one feels towards the military mission. It is a function of the resolve and motivation that an individual brings to a problem—the amount of ownership taken and the amount of commitment expressed. Intrinsic responsibility is associated with the concepts of honour, loyalty and duty, those timeless qualities linked to military ethos. Of all the components in the dimensions of command, intrinsic responsibility is the most fundamental. Without it, very little would be accomplished.

Command Capability Space and the Balanced Command Envelope. Pigeau and McCann propose that competency, authority and responsibility each define one axis of a 3-dimensional volume that encompasses the entire space of command capability (Figure 6.1). That is, military members can each be positioned in this space, with their locations specifying the degree and type of command capability they possess. Individuals with high levels of competency, authority and responsibility—i.e., occupying the far upper right-hand corner of the space—represent high levels of command capability, presumably senior officers. Individuals with low levels of competency, authority and responsibility—i.e.,

occupying the near lower left-hand corner of the space—represent low levels of command capability, presumably junior non-commissioned personnel. Furthermore, they hypothesize that the command capability of each person in a military organization should *ideally* lie inside the *Balanced Command Envelope (BCE)*, a diagonal column⁴⁰ of space running from low competency, authority and responsibility to high, as shown in Figure 6.1. Individuals lying outside the BCE have reduced command capability due to an imbalance in one or more of the command dimensions. For instance, an organization may have put an individual in the position of expecting them to take responsibility for a situation for which they lack the authority (e.g., the resources and power) to influence. Alternatively, an organization may under-utilize individuals with high levels of competency by assigning them tasks with too little authority and responsibility. The point is that being off the BCE runs the risk of compromising command effectiveness—that is, of compromising an individual’s ability to creatively express their will in the accomplishment of the mission.⁴¹

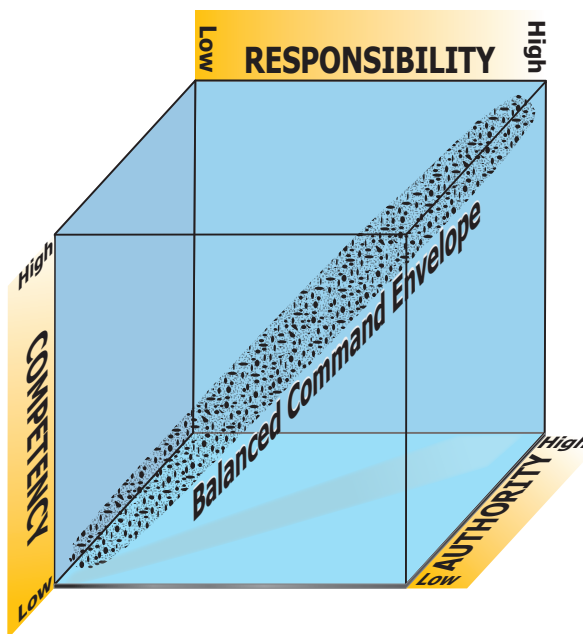


FIGURE 6.1. COMMAND CAPABILITY SPACE WITH THE BALANCED COMMAND ENVELOPE⁴²

Pigeau and McCann’s human-centred definition of command is a powerful tool for deducing some organizational principles (like the BCE). However, the careful reader will notice that simply specifying command characteristics is insufficient for completely describing C². How can one facilitate and support, for example, command expression? Under what conditions does the creative expression of will best manifest itself? Alternatively, unbridled creativity can lead to uncoordinated activity and organizational chaos. Under what conditions should the creative expression of will be limited or channelled? The answer to these questions is control. Command must execute control both 1) to support and facilitate creative command,

40 Whether the envelope is actually linear, as shown in figure 6.1, or some type of curve, is an empirical question that research can answer.

41 These sections on dimensions of command and the Command Capability Space and the Balanced Command Envelope are extracted from G.E. Sharpe and Allan English, *Principles for Change in the Post-Cold War Command and Control of the Canadian Forces* (Kingston, ON: Canadian Forces Leadership Institute, 2002), 73-5.

42 This figure is based on Pigeau and McCann, “Re-conceptualizing Command and Control,” presentation given to Command and Staff Course 31, CFC, 3 September 2004.

while 2) controlling command creativity. Indeed, much of organizational theory can be seen as the attempt to establish the optimum balance between these two extremes.

As we have seen, they defined control as *those structures and processes devised by command both to support it and to manage risk*. The relationship between command and control is shown in Figure 6.2. Structures are frameworks of interrelated concepts that classify and relate things. The military environment encompasses a host of control structures (e.g., chain of command, order of battle, databases for describing terrain, weapon systems, organizations, etc). Structures are attempts to bound the problem space and give a context within which creative command can express itself. For example, an organization’s mission statement is a strategic level structure whose purpose is to give long-term guidance to all members (including managers) in how to apply and channel their motivation and creativity. Once stable structures have been established, processes can be developed to increase efficiency. Control processes are sets of regulated procedures that allow control structures to perform work. They are the means for invoking action. Military rules of engagement (ROE), for example, are formal processes for regulating the use of power—for specifying the way in which military structures (e.g., soldiers, battle groups, and squadrons) are permitted to achieve their objective. Process increases speed of response and reduces uncertainty.

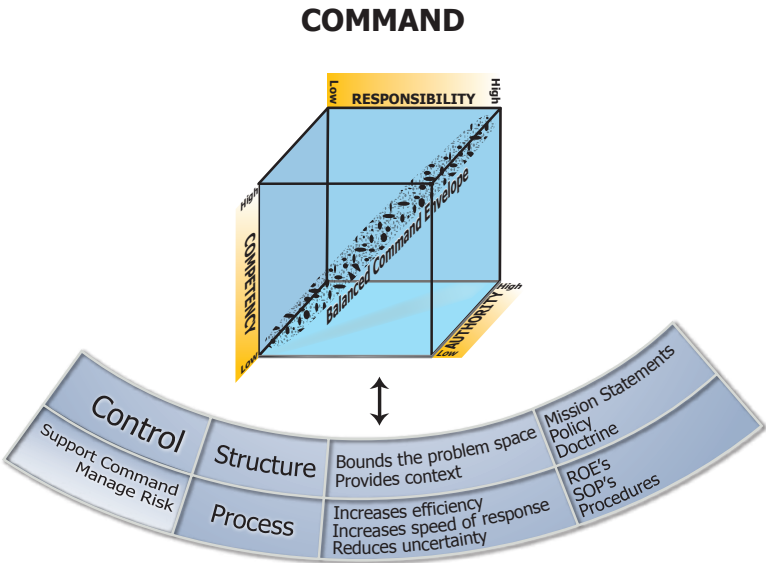


FIGURE 6.2. THE RELATIONSHIP BETWEEN COMMAND AND CONTROL⁴³

Knowing which structures and processes to invoke in order to achieve operational success is a key issue for command. Recall that their definition specifies that control is *devised by* command. Structures and processes come into existence only through some creative act of human will. What are the guidelines for knowing when new control systems should be developed or when existing control systems should be allowed to continue? Their definition specifies two broad guidelines. First, structures and processes should exist to support command. They should facilitate (or at least not hinder) the potential for creative acts of will. They should facilitate (or at least not hinder) the expression of competencies (physical, intellectual, emotional and interpersonal). They should clarify pathways for legal authority;

43 This figure is based on Pigeau and McCann, “Re-conceptualizing Command and Control,” presentation given to Command and Staff Course 31, CFC, 3 September 2004.

they should encourage (not impede) the opportunity to establish personal authority. And finally, they should encourage the willing acceptance of responsibility while at the same time increasing motivation in military members. From an organizational perspective, any control system that forces its members off the Balanced Command Envelope will, over time, compromise organizational effectiveness.

The second criterion for knowing when control should be invoked is whether it promotes the management of risk. Pigeau and McCann define risk loosely as anything that jeopardizes the attainment of the mission. This includes uncertainties due to personnel (including the adversary), uncertainties in the environment (e.g., weather, terrain, etc), and the unbridled expression of creativity, since such expression may lead to chaos. Imposing an elaborate control structure and process is one way to reduce risk; however, this would come at the expense of inhibiting command creativity—creativity that, inevitably, is needed for solving new problems.

A tension exists, therefore, between the two reasons for creating control: to facilitate creative command and to control command creativity. Getting the balance right is a perennial challenge for most organizations. Pigeau and McCann suggest that, as a general strategy, militaries should give priority to facilitating creative command. Mechanisms for controlling command creativity should then be used wisely and with restraint.

Their definitions of command and of control (as separate concepts) were designed to highlight a military's most important asset: the human. However, a military is not simply a collection of independent individuals, each of whom pursues his or her own interpretation of the mission. Militaries are organizations for coordinated action, for achieving success by channelling the creative energies of their members towards key objectives. It is this important feature of military capability that they emphasize in their new definition of C^2 : *C² is the establishment of common intent to achieve coordinated action*. Without coordinated action military power is compromised. Without common intent coordinated action may never be achieved. In their work Pigeau and McCann have specified some of the issues that must be addressed to elucidate common intent. They include a definition of intent itself (i.e., aim or purpose with associated connotations), an identification of two types of intent (explicit and implicit) and the mechanisms for sharing intent among military members, particularly between superiors and subordinates.

The key concept in their definition is *intent*, that is the set of connotations associated with a specific aim or purpose. When a commander gives the order to "Take hill x by 1300 hours," he not only means take hill x explicitly, but also means: "Take hill x while making effective use of your resources, without killing innocent civilians, etc." Thus the commander's intent is made up of two components. The first is *explicit intent*, that part which has been made publicly available through orders, briefings, questions and backbriefs. It includes communications that can be written, verbalized or explicitly transmitted. But it is impossible to be explicit about every minute aspect of an operation. For expediency's sake some things (actually most things) are left uncommunicated. Thus explicit intent carries a vast network of connotations and expectations—the *implicit intent*. Implicit intent derives from personal expectations, experience due to military training, tradition and ethos and from deep cultural values. Much of implicit intent may be unvocalizable. And it is usually acquired slowly—through cultural immersion or years of experience. Finally, common intent consists of (1) the explicit intent that is shared between a commander and subordinates immediately prior to or during an operation, plus (2) the [much larger] operationally-relevant shared implicit intent that has been developed over the months, and even years, prior to the operation.

Pigeau and McCann's definition of C² allows for two contrasting kinds of organizational structures. When the proportion of shared explicit intent in a C² organization is high compared to the amount of shared implicit intent, this is indicative of centralized C². Members of a centralized organization are explicitly told not only what to do in a particular situation, but how to do it. If the situation changes quickly, however, the generation and dissemination of new orders may not be fast enough. On the other hand, if an organization encourages the sharing of implicit intent, the amount of explicit intent necessary to achieve the same level of common intent will be small. In the military context, de-centralized organizations are consistent with mission command philosophy. De-centralized organizations are flexible, but at the expense of efficiency. Note, though, that Pigeau and McCann's new perspective on C² is intended to be value free. They do not advocate one organizational structure or the other; they wish only to indicate that the idea of common intent is consistent with both.⁴⁴

Now that we have established the historical and theoretical bases of command in a Canadian context, it is time to examine Canadian Air Force command, especially in expeditionary operations.

Part 3 – Air Force Command in the 21st Century

Command and Control Implications for Canadian Forces Air Expeditionary Operations⁴⁵

Before examining issues related to the command and control of Canada's Air Force in expeditionary operations, it is first necessary to clarify what is meant by the term "expeditionary." Gimblett has pointed out that technically any application of Canadian military force beyond Canada's territorial limits is, by definition, expeditionary.⁴⁶ The United States armed forces, on the other hand, as Thierry Gongora has noted, define an expedition as "a military operation by an armed force to accomplish a specific objective in a foreign country" and an expeditionary force as "an armed force organized to accomplish a specific objective in a foreign country."⁴⁷ For the purpose of this chapter, the term expeditionary refers to a combination of both of the above definitions: the deployment of CF resources outside of Canadian territory into a foreign country or foreign territory for the purpose of accomplishing a specific objective.

With this definition of expeditionary in mind, this part of the chapter will focus on command and control issues concerning Canadian air expeditionary forces with the following assumptions in mind:

- Canada will never act alone in expeditionary operations; it will instead operate as a member of a multinational coalition.

44 This material is excerpted from Sharpe and English, *Principles for Change in the Post-Cold War Command and Control in the Canadian Forces*, 78-80.

45 This section of this chapter consists of edited excerpts from Richard Goette, "Command and Control Implications for Canadian Forces Air Expeditionary Operations," in Allan D. English, *Canadian Expeditionary Air Forces*. Proceedings of the 2003 Air Symposium held at the Canadian Forces College. Bison Paper 5, (Winnipeg: Centre for Defence and Security Studies, 2004), 67-82.

46 Richard Gimblett, "The Canadian Way of War: Experience and Principles," paper presented at the Seapower Conference 2002, Dalhousie University, Halifax, NS, 7-9 June 2002 (revised November 2002), 6. Also published in Allan D. English, ed. *Canadian Expeditionary Air Forces*. Proceedings of the 2003 Air Symposium held at the Canadian Forces College. Bison Paper 5, Winnipeg: Centre for Defence and Security Studies, 2004, 9-20.

47 Thierry Gongora, "The Meaning of Expeditionary Operations from an Air Force Perspective," paper presented at the Seapower Conference 2002, Dalhousie University, Halifax, NS, 7-9 June 2002, 2. Gongora's original source is Department of Defense, *Dictionary of Military and Associated Terms* (Washington, D.C.: Joint Doctrine Division, publication JP 1-02, 2001), 156. Also published in Allan D. English, ed. *Canadian Expeditionary Air Forces*. Proceedings of the 2003 Air Symposium held at the Canadian Forces College. Bison Paper 5, Winnipeg: Centre for Defence and Security Studies, 2004, 21-34.

- It is most likely that Canada will operate as a member of a coalition in which the United States is not only a part, but also will most likely lead.
- Nevertheless, Canada's Air Force should also prepare for the possibility that it will operate in multinational coalitions in which the United States is *not* a member.
- Although war-fighting is the main role for which the CF prepares, it must also be recognized that it is by no means the only role for Canada's military.
- Command of Canada's air forces in expeditionary operations will remain with Canada. This means that targeting will also remain a Canadian decision, and that political considerations and Canadian interests are taken into account.
- The Navy and the Army are traditionally the first CF environments to deploy on expeditionary operations.

Not all CF expeditionary campaigns will consist of the Canadian Air Force operating independently; Air Force elements will also have to operate jointly with the other environments and the different services of other nations' militaries.

Based on these assumptions, it is argued here that in order for the Canadian Air Force to successfully undertake expeditionary operations, it must develop a command and control culture that is adaptable and flexible. Such adaptability and flexibility has become necessary given the unpredictability of the international situation in the post-Cold War era.

The Unpredictability of the Post-Cold War Era and the Need for Flexible Command and Control. During the Cold War, Canada had an identifiable enemy and knew what it had to prepare for in the event of hostilities, but with the emergence of a "new world order," it is more difficult to know what to prepare for in the way of military options to support government policy. This problem is especially apparent when preparing for expeditionary operations, as situations where military forces will be required are much more likely to occur overseas than in the domestic sphere. The dilemma for the CF, as Gimblett has noted, is that in the post-Cold War era the CF's response to individual crises has generally been ad hoc, because Canada's military has not specifically prepared for expeditionary operations.⁴⁸ Furthermore, such responses have not all been of the traditional war-fighting type of role. Indeed, conflicts in the post-Cold War era have necessitated both symmetrical and asymmetrical responses, which have ranged from the more traditional war-fighting roles to non-traditional roles such as peacemaking, peacekeeping, peacebuilding, and humanitarian efforts.⁴⁹ Although it is necessary to ensure that Canada's Air Force possesses a war-fighting role when considering air expeditionary operations, it would be inadvisable to solely focus on this role given the unpredictability of the post-Cold War international scene.

With such unpredictability and the resultant need for Canada's Air Force to prepare for a multitude of roles, it is therefore logical to ensure that the Air Force's command and control structure and culture is flexible. This requirement has been outlined best by Sharpe and English:

C² structures should be designed so that they can evolve quickly to meet changing needs. Structures and processes that foreclose on future options should be avoided. To be adaptable to changing circumstances C² structures should be developed as learning mechanisms that process experiences and use them to improve the system. The

48 Gimblett, "Canadian Way of War," 4.

49 Al Okros, "Into the Twenty-first Century: Strategic Human-Resources Issues," in Douglas Bland, ed., *Backbone of the Army: Non-Commissioned Officers in the Future Army* (Montreal: McGill-Queen's Univ. Press, 2000), 31; and Gongora, "Expeditionary Operations from an Air Force Perspective," 11.

unpredictability of future operations requires that any CF C² system be able to change its control philosophy rapidly to accommodate whatever situations may arise.⁵⁰

Nevertheless, before such C² systems for air expeditionary operations can be developed, there must be a common understanding of command and control in the Canadian Forces. The best option for the CF regarding command and control is incorporating the model that Ross Pigeau and Carol McCann have developed (see above).

The Requirement for a Common Understanding of Command and Control: Using the Pigeau and McCann Framework. All three domains of the CAR Structure are crucial for air expeditionary operations. Competency is of particular importance when discussing the issue of air expeditionary force commanders. One of the most important competencies for officers operating in an expeditionary environment is that of interpersonal interaction with one's subordinates and allies. As Pigeau and McCann note, the basis of interpersonal interaction is the social skills that one develops from childhood. Indeed, these social skills are crucial for an officer operating in an expeditionary environment, as they include the attributes of "trust, respect, perceptiveness and empathy that promote effective teamwork," all of which are crucial for operating with one's allies.⁵¹ If commanders are able to develop these interpersonal competences properly, they will be able to earn respect and admiration from their peers and subordinates.⁵²

The two remaining aspects of the CAR structure, authority and responsibility, are also important for air expeditionary operations. The respect and admiration that comes from a commander's good interpersonal competency are also significant in regards to the authority that a commander exercises. In fact, respect and admiration are key in assuring that commanders are able to develop the personal authority they need to command effectively. Furthermore, legal authority, together with the extrinsic responsibility of a commander, are also crucial considerations for a command and control structure of an expeditionary operation in which a Canadian officer must work.⁵³ This is especially true in regards to command decisions taken for the missions in an expeditionary environment.

Technology, Targeting, Politics and the Implications for Command and Control. The past 20 years have seen a massive growth in technological innovation with regards to the military. Whether this has been an evolutionary process or a Revolution in Military Affairs will not be debated here, suffice to say that the technological implications of this phenomenon have had and will continue to have huge implications on the command and control of air expeditionary forces. Modern technology has placed an unprecedented amount of information at the hands of the commander. Since the best command decisions are made when commanders have the best information available to them (i.e., information superiority) it is therefore easy to assume that today's commander has the tools to make the best decisions. The reality in fact is quite different, as today's commanders are often presented with too much information; therefore, they must be able to distinguish the "need to know" from the "neat to know" information. Indeed, the vast amounts of data now available to a commander threatens to become an overload of information which can harm mission performance. Commanders and their staffs must be able to filter the raw data into

50 G.E. (Joe) Sharpe and Allan D. English, *Principles for Change in the Post-Cold War Command and Control of the Canadian Forces*, (Winnipeg: Canadian Forces Training Material Production Centre, 2002), xvii.

51 Pigeau and McCann, "Re-conceptualizing Command and Control," 58.

52 Pigeau and McCann, "What is a Commander?" 85.

53 Ibid., 85-87.

useful knowledge from which they can make their decisions.⁵⁴ The consequence of such a phenomenon is that the information overload can conflict with pressures to accelerate the decision cycle of commanders.⁵⁵ This can be problematic enough for nations when operating individually, but when operating with coalition partners in expeditionary operations, this tension between information overload and increased decision cycle speed promises to have important implications for command and control.

One of the underlying principles of the CF operating in a coalition or alliance command and control process/structure is that Canadian interests must be respected. In the past, Canadian interests have been represented by either a Liaison Officer or by a National Command Element attached to or affiliated with the coalition command and control structure.⁵⁶ Historically, the control of air assets occurred through Air Tasking Orders, which typically had a 72-hour planning cycle. This cycle provided plenty of time for the Liaison Officers or the Canadian National Command Element to provide Canadian input and to assert Canadian interests. However, technology has reduced the commander's decision cycle and the result is that a 72-hour Air Tasking Order planning cycle is no longer realistic. The current dilemma for Canadian officers involved in an expeditionary command and control structure is how to ensure that Canadian input on decisions and Canadian interests are met in the modern decision cycle.⁵⁷

This issue is all the more apparent today because of the increased politicization of targeting. Modern technology has improved the precision of air-launched weapons to the point that commanders are, by and large, able to pick and choose the specific targets they want to hit. Consequently, there has been disagreement during coalition operations in the past few years among different coalition partners as to what constitutes a valid military target. Different coalition members may not be signatories to the same agreements (i.e., the Ottawa Land Mine Treaty) or arm their aircraft with the same weapons.⁵⁸ This presents a potential dilemma for a Canadian officer involved in an expeditionary command and control structure, for it may bring this officer into a conflict between fulfilling the mission and safeguarding Canadian interests. One possible scenario is that of a Canadian commander in a coalition command and control structure who is required to make a command decision for an American pilot to destroy a certain target. American interests might dictate that the target is a valid military objective, but Canadian interests may not coincide. Therefore, while the Canadian position might not support the destruction of the target, the officer still has to make the command decision to order the pilot to strike (or not to strike). Such a scenario would not only place a huge amount of responsibility and stress upon a commander, but also could possibly endanger the subordinate in the cockpit should the pilot not attack.

Canada is a liberal democracy and as such its military must protect and respect Canadian interests. In the above scenario, the commander must balance the extrinsic responsibility and legal authority in order to ensure that Canadian interests are respected. These days commanders are being held increasingly accountable for every action of their forces. Indeed, since the targeting process requires national authority to fire, the commander must

54 Allan English, "Contemporary Issues in Command and Control," in Dennis Margueratt and Allan English, eds., *Air Symposium 2001: Intelligence, Surveillance and Reconnaissance* (Winnipeg: Canadian Forces Training Materiel Production Centre, 2001), 98-100; Timothy L. Thomas, "Kosovo and the Current Myth of Information Superiority," *Parameters* 30, no. 1 (Spring 2000), 13-29.

55 Syndicate 6 Air Term, CSC 29, "2003 Air Symposium: Command and Control within an Expeditionary Air Force," presentation given at the 2003 Air Symposium, Canadian Forces College, Toronto, ON, 4-5 March 2003, 3.

56 Ibid., 7. The Syndicate notes further that for air force assets, this usually occurs in the Combined Operations Center, which is most often commanded by an American general officer.

57 Ibid., 7-9.

58 For example, Canadian aircraft do not employ cluster munitions. Ibid., 9.

be able to accept the risk of collateral damage—i.e., inadvertently killing civilians—that a decision to fire might entail.⁵⁹ This issue of collateral damage has been made all the more imperative with the recent growth of information technology and news reporting. Non-military agencies now have access to unprecedented amounts of information and the Orwellian “Big Brother” increasingly has his eye on the military. The implications for commanders are considerable, for, as Okros has noted, “leaders must also be prepared to fight and win while being observed, and held accountable, by politicians and the civilian population.”⁶⁰ Clearly, today’s information advances have increased the importance of politics in regards to targeting and have subsequently had an important influence on expeditionary command and control structures.

The increased politicization of targeting and the resulting increased sensitivity of command decisions have also had another impact on the expeditionary command and control structure. Because of the great political risks that collateral damage entails, some air commanders now wish to exercise greater control over air assets.⁶¹ Due to their nature, expeditionary operations are replete with uncertainty, so in an effort to reduce this uncertainty as much as possible, a commander is most likely to interfere by attempting to exercise more control. If this control becomes micromanagement, it has the potential to be problematic. Although increased control provides the commander with increased certainty, more centralized control threatens not only to slow down decision-making, but also to undermine the authority of subordinate commanders.⁶²

Two recent Western air campaigns, Operation ALLIED FORCE and Operation APOLLO, “have demonstrated that commanders at the highest level can now exercise close control over aerospace assets, much more so than could be exercised over air forces in the past or by the army and navy today.”⁶³ However, by trying to control as much as possible, commanders risk the possibility of simply putting too much on their plate. As we have seen, with today’s technology there is a very real possibility that the volume of information available will overwhelm a commander’s capacity to assimilate the importance of the vital parts of this information and respond with effective and timely decisions. The result of being overwhelmed would be a slowing-down of a commander’s decision-making process, which could be devastating for the successful execution of operations.⁶⁴

Micromanagement also threatens to have a significant negative effect on subordinate commanders. With some senior commanders attempting to implement as much centralized control as they can, the result will not only be complacency and a loss of local initiative, but also, and perhaps more importantly, the development of a belief by the subordinate commander that the superior does not have confidence in the subordinate’s abilities.⁶⁵ The consequences could be very damaging: morale could plummet and the authority of aircrew and their immediate commanders to carry out the functions of control or command could be

59 English, “Rethinking ‘Centralized Command and Decentralized Execution,’” 76.

60 Okros, “Strategic Human-Resources Issues,” 33.

61 English, “Rethinking ‘Centralized Command and Decentralized Execution,’” 76.

62 Syndicate 6, “Command and Control within an Expeditionary Air Force,” 13; and Victor Budura, Jr, *The Command or Control Dilemma: When Technology and Organizational Orientation Collide*, paper presented to the Air Force 2025 Conference, April 1996, 11.

63 English, “Rethinking ‘Centralized Command and Decentralized Execution,’” 75. Such a scenario also closely resembles what Thomas Czerwinski has described as “command-by-direction.” Excerpts from the English paper are found later in this chapter.

64 Syndicate 6, “Command and Control within an Expeditionary Air Force,” 13.

65 Ibid., 13; Closing Address by the Chief of the Air Staff, Lieutenant General Lloyd C. Campbell, Air Symposium 2002: Command and Control, Canadian Forces College, 27-28 March 2002; and English, “Rethinking ‘Centralized Command and Decentralized Execution,’” 75.

severely limited.⁶⁶ Furthermore, commanders could lose much of their personal authority, thereby moving them off the Balanced Command Envelope.

One of the main command and control issues concerning expeditionary air operations, then, is to balance the risk of too much uncertainty against the risk of a slower decision-making cycle and demoralizing subordinates by deciding how much control a commander should exercise. Phillip Meilinger has noted that technology has now permitted two command and control options to commanders in order to tackle this issue: a centralized control-centralized execution air campaign or decentralized control-decentralized execution air campaign. During Operation APOLLO, the Commander-in-Chief Central Command, US Air Force General Tommy Franks, opted for the former option and utilized his staff instead of component commanders to exercise control over aerospace resources.⁶⁷ This is not surprising, given that the US Air Force stresses that “centralized control [is] the best way to effectively command airpower.”⁶⁸ It is therefore logical to assume that the US Air Force will continue to favour centralized control as a C² philosophy. This is especially important to note when discussing the issue of CF air expeditionary operations because Canadian air forces will most likely operate in coalitions in which the US takes a leading role. Therefore, interoperability in coalition expeditionary operations is a key issue.

Interoperability, Command and Control, and the Canadian Air Force in Multinational Coalitions. It is probable that Canada will continue to engage in broad-based alliances or coalitions in the future. Canadian involvement in such groups not only acts as a counterweight to American dominance and propensity towards unilateralism, but it is also critical for Canada’s international status as this involvement provides a means for Canada to project its influence in the international scene.⁶⁹ If Canada chooses to be part of a coalition, it obviously wants its interests to be known and respected by its allies. Given the small size of the CF, it is clear that Canada’s military will not play the largest or the leading role in such a coalition; therefore, the challenge for future Canadian expeditionary forces will be to incorporate the specific Canadian requirements and interests as a junior partner within a larger coalition construct.⁷⁰

To be able to ensure that Canadian interests and requirements are met in coalition expeditionary operations, it is necessary that the CF be involved in the coalition’s command and control process/organization. To do so, however, Canada must first meet some requirements. First, as Gimblett notes, Canada needs to send sufficient resources in order to have appropriate input to the command and control process/organization:

Where Canadian governments might be content merely to have the national flag noted in coalition or alliance operations, greater national input into those operations is more likely to be assured with high-level command representation. In other words,

⁶⁶ English, “Rethinking ‘Centralized Command and Decentralized Execution,’” 75; and Pigeau and McCann, “Re-conceptualizing Command and Control,” 57.

⁶⁷ English, “Rethinking ‘Centralized Command and Decentralized Execution,’” 75; Phillip S. Meilinger, “Preparing for the Next Little War: Operation Enduring Freedom Points to New Ways of Warfighting,” *Armed Forces Journal International* (April 2002), 2.

⁶⁸ Cited in English, “Rethinking ‘Centralized Command and Decentralized Execution,’” 75. English cites USAF’s *Air Force Basic Doctrine*, AFDD-1 (September 1997).

⁶⁹ Gimblett, “Canadian Way of War,” 7; and Closing Address by the Chief of the Air Staff, Lieutenant General Lloyd C. Campbell, Air Symposium, “Canadian Expeditionary Air Forces,” Canadian Forces College, Toronto, 4-5 March 2003. Gimblett also notes that despite the Canadian propensity to engage in broad-based alliances or coalitions, when it comes to armed conflict situations, “the core partners... tend to be the ABCA nations (America, Britain, Canada, Australia).”

⁷⁰ Syndicate 6, “Command and Control within an Expeditionary Air Force,” 29.

sovereignty within the international military community is best assured by being able to field formations large enough to warrant independent command.⁷¹

It is clear that “size matters,” both in terms of materiel and human resources, in regard to the amount of input the CF will have on expeditionary command and control processes/organizations.⁷²

Second, the CF needs to develop a cooperative expeditionary culture and mindset that will make it interoperable with coalition allies if it hopes to participate in future expeditionary command and control processes/organizations. Interoperability is key for expeditionary operations, for, as Gongora has noted, “the most deployable [i.e., expeditionary] force will not be considered by a coalition if once deployed it cannot operate effectively with other members due to language or doctrinal barriers, or incompatibility in equipment and supplies.”⁷³ It would appear that the simplest way for Canada’s Air Force to circumvent such potential problems would be to ensure that its doctrine adheres to those of its allies. Indeed, one of the key means of ensuring Canadian Air Force interoperability with coalitions is to make certain that CF aerospace doctrine is *compatible* with those of major coalition partners. Compatibility, however, does not mean that Canadian doctrine has to be *identical* to the doctrine of one’s allies.⁷⁴ To simply duplicate the doctrine of another country’s military is dangerous because such doctrine has been developed to reflect that nation’s military organization, capabilities, culture, and strategic issues/problems.⁷⁵

Nevertheless, it is clear that compatible doctrine alone will not completely suffice when endeavouring to become interoperable with coalition expeditionary command and control processes/organizations. As Paul Johnston has noted, “doctrine is not enough.” Doctrine, Johnston continues, actually has a weak or indirect effect on the behaviour of armed forces in operations. Instead, how armed forces operate is “more a function of their culture than of their doctrine.”⁷⁶ Therefore, instead of focusing solely on expeditionary *doctrine* development, it would also be prudent for Canada’s Air Force to develop an air force *culture* and mindset that allows commanders to work with coalition partners.⁷⁷ How this is to be done is a major issue that Canada’s Air Force must tackle.

In order to ensure that Canada’s Air Force is able to plug into larger US and coalition expeditionary command structures, it will be necessary to ensure that the Air Force’s cultural framework is able to import concepts and terms from other cultures to promote interoperability.⁷⁸ One way to go about achieving this goal is to increase the exposure of CF officers to potential coalition partners (and conversely those potential partners to the CF) through training and liaison. This practice not only would reduce the potential for problems once deployed, it would also allow the CF to develop a cadre of trained officers to draw from when needed for expeditionary operations.⁷⁹

71 Gimblett, “Canadian Way of War,” 16.

72 Gimblett, “Canadian Way of War,” 16; and Gongora, “Expeditionary Operations from an Air Force Perspective,” 25.

73 Gongora, “Expeditionary Operations from an Air Force Perspective,” 20.

74 Syndicate 6, “Command and Control within an Expeditionary Air Force,” 22.

75 English, “Rethinking ‘Centralized Command and Decentralized Execution,’” 72. English is referring specifically to joint doctrine here, but I believe that this argument can be expanded to include all doctrine in general as well.

76 Paul Johnston, “Doctrine Is Not Enough: The Effect of Doctrine on the Behaviour of Armies,” *Parameters* 30, no. 3 (Autumn 1996), 30.

77 Johnston, “Doctrine Is Not Enough,” 37; and Syndicate 6, “Command and Control within an Expeditionary Air Force,” 17.

78 Syndicate 6, “Command and Control within an Expeditionary Air Force,” 17.

79 *Ibid.*, 22-23.

Nevertheless, before exposing CF officers to potential coalition partners, it is first necessary to ensure that these officers are properly prepared for such exposure. Such preparation will require “professional development based on education, training, and experience throughout the careers of members of the Canadian Forces.”⁸⁰ Training in the CF creates competence in its military personnel by allowing them to use the equipment or tools required for current military tasks. However, by concentrating training to use equipment, training and education for *command*, which includes activities such as decision-making, problem solving, negotiating skills, and teamwork, has been largely neglected.⁸¹ Consequently, appropriate professional development in the form of education and experience are crucial for preparing future commanders and it is in these areas where resources must be dedicated.

Recently the demographics of those in the CF have been moving away from the more traditional blue-collar member to more highly-skilled knowledge workers. Okros stresses that along with this change must be “a shift from short-term, task-oriented training to longer-term, broader education and professional development.”⁸² Consequently, the Canadian professional military education system must be able to educate future commanders to think and learn to give them the confidence to operate in the new environments within which the CF is obliged to work. Such new environments include expeditionary operations in the unpredictable post-Cold War world.⁸³ One of the main problems that the CF faces in this regard is that it is often very difficult for officers to be able to get away from their current jobs in order to pursue another degree.⁸⁴ Nevertheless, education must remain a key priority if Canada’s Air Force hopes to have the people it needs to play a role in expeditionary command and control processes/organizations.

Practical application, or experience, must also be high on the list of professional development priorities. As Pigeau and McCann have noted, command potential, and therefore the creation of adequate command structures, is best achieved by giving commanders and potential commanders “favourable conditions for command expression.” Although “favourable conditions” include professional military education, it is perhaps even more important to grant commanders “opportunities for exercising authority,” that is, the chance to actually *exercise* command.⁸⁵ This can be achieved by deploying on expeditionary operations and by seeking additional planning positions and exercises with one’s allies.⁸⁶ However, such solutions will not go far enough to ensure success. What is also needed is a formal mentoring system that will ensure that the CF is able to grow and retain competent commanders. Indeed, such mentoring is absolutely crucial given the size of the CF and the resultant limited existing command opportunities.⁸⁷ In sum, it is clear that not only training, but also education and practical experience are crucial for the development of commanders in Canada’s Air Force who will be able to participate effectively in expeditionary command and control processes/structures.

80 Pigeau and McCann, “Re-conceptualizing Command and Control,” 61; Sharpe and English, *Principles for Change*, xiv. Quote from Sharpe and English.

81 Syndicate 6, “Command and Control within an Expeditionary Air Force,” 16. Pigeau and McCann note that this phenomenon is largely due to the fact that Canadian military culture traditionally values control over command and hence training over education. See Ross Pigeau and Carol McCann, *Taking Command out of C2* (Toronto: Defence and Civil Institute of Environmental Medicine, 1996).

82 Okros, “Strategic Human-Resources Issues,” 36.

83 Syndicate 6, “Command and Control within an Expeditionary Air Force,” 15-16.

84 Seminar 3 Findings, Preparation for Command – Education Training, and Experience, Air Symposium 2002: Command and Control, Canadian Forces College, 27-28 March 2002.

85 Pigeau and McCann, “Re-Conceptualizing Command and Control,” 57, 61. Quotes from page 57.

86 Seminar 3 Findings, Preparation for Command – Education Training, and Experience, Air Symposium 2002: Command and Control, Canadian Forces College, 27-28 March 2002.

87 Syndicate 6, “Command and Control within an Expeditionary Air Force,” 16-17.

Conclusion. It has been argued here that the Canadian Air Force must develop a command and control culture that is adaptable and flexible if it is to successfully undertake expeditionary operations. This requirement is necessary in light of the unpredictable nature of conflict in the post-Cold War international world scene. Furthermore, there is first a requirement for a common understanding of command and control in the CF. It appears that the Pigeau and McCann command and control framework, based on the CAR Structure and the Balanced Command Envelope, is the best C² option available to Canada's military.

Of the several command and control issues that have been discussed in this chapter, one of the most pressing today is technology's acceleration of the decision-making cycle and the resultant difficulties regarding the need for Canadian input into targeting and the ability to ensure that Canadian interests are respected in coalition command and control processes/structures. The politicization of targeting, which has created a climate in which excess collateral damage is abhorred, plus the increased information-gathering and reporting abilities of non-military agencies such as news services, have combined to put increased responsibilities and stress on commanders operating in expeditionary campaigns. Furthermore, the increased politicization of targeting and the resulting sensitivity of command decisions have also led commanders, out of a desire to reduce the political risks of collateral damage, to exert greater control over air assets. As we have seen, such micromanagement threatens both to slow down decision-making and to undermine the authority and morale of subordinate commanders.

Canadian expeditionary forces will need to incorporate specific Canadian requirements and interests as junior partners within a larger coalition construct. Consequently, in order to ensure that the Canadian Air Force can be interoperable within a coalition and involved in its command and control process/structure, it needs to fulfill two requirements. First, it must send sufficient materiel and human resources in order to assure high-level Canadian command representation. Second, and perhaps most importantly, the Canadian Air Force must develop a cooperative and flexible expeditionary culture and mindset that will make it interoperable with coalition allies. Doctrinal changes alone will not suffice; only through cultural changes will the Air Force be successful. Exposure of Air Force officers to potential coalition partners through liaison programs is one aspect of assuring such cultural change. More important, however, is the requirement to ensure that Canadian officers receive the proper command development in the form of training, but especially professional education and experience.

Finally, the Air Force must recognize that typical CF expeditionary operations have tended to be a Navy-Army domain. Nevertheless, it must be realized that Air Force elements (usually in the form of rotary-wing platforms) will deploy along with the Navy and Army forces. Consequently, planners must prepare for the inevitability that the Air Force will have to deal with joint command and control issues on expeditionary operations. Part of such preparation must also include the need for Air Force officers to develop cultural sensitivities that are conciliatory and that demonstrate a willingness to cooperate with other services and other nations in order to accomplish the mission.

Now that we have examined the historical and theoretical context for Canadian Air Force C², and discussed issues related to the command of the Canadian Air Force during expeditionary operations, it is time to look at those C² concepts that currently are having the greatest impact on the theory and practice of air force operations. These concepts, especially networked operations, effects based operations and centralized command and decentralized execution, will be considered next.

Part 4 – Evolving Command and Control Concepts

Networked Operations and Air Forces⁸⁸

Before addressing Canadian Air Force command issues specifically, it is necessary to put the subject of air force command in the context of the larger command debates at the beginning of the 21st century. Currently, the American concept of Network-Centric Warfare (NCW), and its Canadian cousin Network Enabled Operations (NEOps), are dominating the debate on command and control. Yet there are many misconceptions about how these concepts might impact on future air force C² arrangements. The following excerpt from a recent DRDC report, summarizes the key issues related to NCW, NEOps and the C² of air forces.

Effective command and control of aerospace forces is critical to mission success, especially during expeditionary operations. Yet, as we have seen, the ad hoc evolution of post-Cold War CF and Air Force C² arrangements, based largely on foreign doctrine and on the limited personal experience of their designers, has led to piecemeal, often dysfunctional, Canadian C² arrangements.⁸⁹ This ad hoc evolutionary process seems to be continuing as the latest concept to influence the CF approach to C² is Network Enabled Operations, a C² concept that has borrowed many of its principles from the American concept of Network-Centric Warfare and has not been subject to rigorous scrutiny by Canadian analysts.

Network Enabled Operations seems poised to become the driving concept behind CF transformation for a number of reasons, not the least of which is Canada's tendency to follow the American lead in new concepts related to war and other operations. Even though NEOps has not yet been clearly defined, recent NEOps conceptual statements indicate a similarity to the American concept of Network-Centric Warfare as NEOps is expected "to generate increased combat power by networking sensors, decision makers and combatants to achieve shared battlespace awareness, increased speed of command, higher operational tempo, greater lethality, increased survivability, and greater adaptability through rapid feedback loops."⁹⁰

This section of the chapter examines NEOps and its progenitor, NCW, and concludes that Canada and the CF should be cautious about using NCW as the basis for NEOps, because the context and needs that are the basis for NCW may not be congruent with Canadian requirements. Furthermore, it is argued that NCW is not really a theory of war, as its proponents claim, but really a series of largely untested hypotheses or assumptions that require validation before they should be accepted as a basis for NEOps.

Each nation and each service in a nation's armed forces have their own unique paradigm of how military operations should be conducted based on the physical environment in which they operate, their historical experience, and their culture, as noted earlier. These physical and cultural settings in which armed forces operate form the basis for a number of critiques of NCW, whose advocates propose a specific type of command-by-influence, or mission command, as a key to future networked operations based on NCW. Observers

88 This section of this chapter consists of excerpts from Allan English, Richard Gimblett, and Howard Coombs, "Beware of Putting the Cart before the Horse: Network Enabled Operations as a Canadian Approach to Transformation," DRDC Toronto, Contract Report CR 2005-212 (19 July 2005), iii-v, 43-8.

89 General R.R. Henault, Brigadier-General (retired), Joe Sharpe and Allan English, "Operational-Level Leadership and Command in the CF – General Henault and the DCDS Group at the Beginning of the "New World Order," in Allan English, ed., *Leadership and Command and the Operational Art: Canadian Perspectives* (Kingston, ON: Canadian Defence Academy Press, 2006), 135-61.

90 Michael H. Thomson and Barbara D. Adams, "Network Enabled Operations: A Canadian Perspective," (Defence Research and Development (DRDC) - Toronto contract report CR-2005-162, 13 May 2005), 5.

of military organizations have noted that different services and even different units within services require different command arrangements and command styles to achieve optimum performance in each setting. For example a combination of culture and “technical and mechanical parameters” are critical determinants on the ability of military personnel to act as unit as well as limiting their own interactions and their interactions with other groups.⁹¹

Despite working in different physical environments with different command and technical systems, the Canadian naval and land force experience, particularly the Army’s stabilization efforts in post-conflict Afghanistan and the Navy’s command of coalition operations in the Arabian Sea, reinforces the belief that the human network, not the technical network, should be the basis for future approaches to CF transformation. However, the differences in the physical environments among land, sea and air forces often dictate different approaches to conducting operations that in turn demand different command arrangements and technical systems. Therefore, as we have seen, a “one size fits all” approach to command and control may not be the best solution for networked operations, even in an increasingly integrated joint and combined operating environment.

The Air Force Paradigm—Effects Based Operations (EBO). During the Cold War, under the rule of the so-called “bomber barons” of Strategic Air Command, the US Air Force generally maintained a deterrence- and nuclear weapons-based strategic focus. However, some in the US Air Force, especially those in Tactical Air Command, were engaged in debates with the US Army over the proper way to employ air forces. While the US Army was struggling to re-define its role based on the operational level of war in the 1970s and 1980s, the US Air Force and many other Western air forces maintained their strategic orientation, even in their doctrine for the use of non-nuclear munitions in various operations around the world. The principal lesson that the US Air Force (and some in the US Navy’s naval aviation community) drew from one of these operations, the Vietnam War, was that the massive application of strategic air power, during the Linebacker II campaign (18–29 December 1972), had single-handedly brought the war to a successful conclusion and that if air power had been used correctly (i.e., strategically) in that conflict, it could have been ended eight years earlier.⁹² Yet, to the chagrin of air power advocates, US Army doctrine continues to emphasize the use of air forces in support of the land mission as demonstrated by this quote from an Army doctrine field manual, FM 3-0: “Air Force air platform support is invaluable in creating the conditions for success before and during land operations. Support of the land force commander’s concept for ground operations is an essential and integral part of each phase of the operation... Fires from Air Force systems create the conditions for decisive land operations. In addition, the Air Force provides a variety of information-related functions—to include intelligence, surveillance, and reconnaissance—that support land operations.”⁹³

Western air forces have challenged this army notion of how air forces should be used in a campaign as we can see from RAF Air Commodore Andrew Vallance’s 1996 statement: “There is no factual basis to the belief that, in land/air campaigns, the purpose of aviation forces must always be to support the land forces. Airpower can and often has acted as lead element in land/air as well as maritime/air operations, and—as capabilities grow—is

91 Ben Shalit, *Psychology of Conflict and Combat* (New York: Praeger, 1988), 121-2. Shalit’s chapter on “Discipline” contains an extensive discussion of these issues.

92 Raymond W. Leonard, “Learning from History: Linebacker II and US Air Force Doctrine,” *Journal of Military History* 58 (April 1994), 267-303.

93 US Army FM 3-0, “Operations,” (14 June 2001), p. 2-7, Sec 2-19.

likely to do so with increasing frequency.”⁹⁴ Current US Air Force doctrine puts it this way: “Unlike surface forces, modern air and space forces do not normally need to sequentially achieve tactical objectives first before pursuing operational or strategic objectives. From the outset, air and space forces can pursue tactical, operational, or strategic objectives, in any combination, or all three simultaneously. From an airman’s perspective, then, the principle of the objective shapes priorities to allow air and space forces to concentrate on theatre or campaign priorities and seeks to avoid the siphoning of force elements to fragmented objectives.”⁹⁵

These opinions represent conventional wisdom in many Western air forces, which has been reinforced in their view by air operations in the Balkans and in the recent Afghanistan campaign. Early in its first term, the Bush administration, particularly the Secretary of Defense, seemed to be favouring force structure changes that would embrace this air force view. Mackubin Thomas Owens, professor of strategy and force planning at the US Naval War College, stated in late 2002 that high ranking US government officials have accepted that: “traditional ground combat is a thing of the past and that future US power will be based on precision strikes delivered by air or space assets, perhaps coordinated and directed by a handful of special operations forces (SOF) soldiers.”⁹⁶ The air force view of war is also being used to challenge the army’s concept of the operational level of war as the focus for war fighting. But this is a relatively recent phenomenon, because air forces have traditionally focussed on technology to the neglect of doctrine. As early as 1945, US air forces espoused three categories of doctrine—basic, operational, and tactical, which is still reflected in the most recent statement of air force doctrine.⁹⁷ However, as James Mowbray has shown, enduring problems in institutionalizing the writing of US Air Force doctrine resulted in the air force paying little attention to its development, until the last decade of the 20th century. This has meant that until very recently the US Air Force, and other Western air forces, have been obliged to follow the lead of the most doctrinally up-to-date service, the US Army. Unlike the US Air Force, which has lately invested a great deal in its doctrinal renewal, the Canadian Air Force has still not put its doctrinal house in order.⁹⁸

The primary US Air Force doctrinal challenge to US Army doctrinal dominance in the late 1980s and early 1990s was an effects-based approach to operations based on John Warden’s work, *The Air Campaign*.⁹⁹ One commentator described the US Air Force challenge this way: “The effects-based approach describes what effects are required to secure strategic objectives and then conduct military actions that would bring about the required effects. The US Air Force champions the effects-based approach and has developed it as a concept nested in a broader ‘Rapid Decisive Operations’ concept by Joint Forces Command.”¹⁰⁰ An effects-based approach can be seen as an outcomes versus an outputs approach to operations. For example, a recent MA thesis written at the US Army Command and General Staff College concluded that the US Army still uses an “objectives-based approach to operations” and recommends that it adopt an “effects-based

94 Andrew G.B. Vallance, *The Air Weapon: Doctrines of Air Power Strategy and Operational Art* (London: Macmillan, 1996), 91, cited in Hallion, “Airpower and the Changing Nature of War,” *Joint Forces Quarterly* (Autumn/Winter 1997-98), 42.

95 Air Force Doctrine Document (AFDD)-1, Air Force Basic Doctrine (Sep 1997), 13.

96 Mackubin Thomas Owens, “Reshaping Tilted Against the Army?” *The Washington Times*, 24 November 2002, at www.washtimes.com/commentary/20021124-22611196.htm.

97 AFDD-1 (Dec 2003), 8.

98 John Westrop, “Aerospace Doctrine Study,” unpublished report dated 30 April 2002, copy at Canadian Forces College library.

99 John A. Warden, III, *The Air Campaign: Planning for Combat* (Washington, DC: Pergamon-Brassey’s, 1989).

100 James K. Greer, “Operational Art for the Objective Force,” *Military Review* 82, no. 5 (September-October 2002), 26. Greer is a former director of the US Army’s School of Advanced Military Studies (SAMS).

approach to operations.”¹⁰¹ This change in approach can be difficult, however, as a detailed study of C² in the Gulf War found that senior commanders generally found it difficult during operations both to distinguish outputs from outcomes and to discover outcomes. In fact the inability to discern what were perceived at the time to be outcomes (e.g., damage to specific enemy capabilities) was usually the reason senior commanders often focussed on outputs (e.g., sortie rates) which did not necessarily have a direct bearing on the desired outcomes of the campaign.¹⁰² Therefore, after the Gulf War, the US Air Force re-doubled its efforts to devise a truly effects-based approach to operations. It should be noted here that, unlike the Canadian Navy with its unique networked-enabled capabilities and the Army with its distinctive approach to manoeuvre and operational art, the Canadian Air Force has not developed its own effects-based approach to operations, and that it generally adheres to the US Air Force version of effects-based operations. The lack of originality in the Canadian Air Force’s approach to effects-based operations is due to the problems the Canadian Air Force has had in producing doctrine, as noted earlier, and in even properly documenting its operations.¹⁰³

Effects Based Operations. The approach to operations championed by the US Air Force, now formally known as Effects Based Operations (EBO), has become another buzzword in the current debate on how war and other operations should be conducted and it is a term now used frequently in the joint arena.¹⁰⁴ A number of commentators have noted that EBO has its roots in ancient (Sun Tzu) and classical (Clausewitz) theories of wars.¹⁰⁵ However, the most recent branch on the EBO theory tree is the one based on the writings of Italian air power theorist Giulio Douhet and Warden. Douhet proposed solutions to the problems encountered by Western nations in the First World War where stalemate at sea and on land caused widespread devastation and loss. He advocated a new style of warfare whereby aircraft would directly attack enemy vital centres, what might be called centres of gravity today, and bring future wars to a quick and decisive conclusion.¹⁰⁶ Ideas like these were modified or developed in parallel by airmen in the US and Britain to win or to maintain the “independence” of air forces from armies and navies from the 1920s through to the 1950s.¹⁰⁷ Therefore, Douhet’s vision of EBO is the one most commonly used in air force circles; however, Ho notes that there is no authoritative definition of EBO and he describes six different theoretical variants on the EBO theme.¹⁰⁸

101 John T. Harris, “Effects-Based Operations: Tactical Utility,” thesis written for the degree of Master of Military Art and Science at the US Army Command and General Staff College (2004), iii.

102 A detailed account of this example can be found in Mark D. Mandeles et al., *Managing “Command and Control” in the Persian Gulf War* (Westport, CT: Praeger, 1996), especially 1-8.

103 Rachel Lea Heide, “Canadian Air Operations in the New World Order,” in Allan D. English, ed., *Air Campaigns in the New World Order*, Silver Dart Canadian Aerospace Studies Series, Vol. 2 (Winnipeg: Centre for Defence and Security Studies, 2005), 79.

104 One of the most detailed descriptions of EBO has been written by former USAF officer Maris McCrabb, “Effects-based Coalition Operations: Belief, Framing and Mechanism,” in Austin Tate, ed., *Proceedings of the Second International Conference on Knowledge Systems for Coalition Operations*, 23-24 April 2002, Toulouse, France, 134-46, www.aiat.ed.ac.uk/project/coalition/kscs/kscs-2002/pdf-parts/S-kscs-2002-paper-02-mccrabb.pdf. Accessed 29 Nov 2006. A summary of the air force view of the evolution of effects-based operations can be found in Phillip S. Meilinger, “The Origins of Effects-Based Operations,” *Joint Force Quarterly* 35 (October 2004), 116-22.

105 See for example Joshua Ho, “The Advent of a New Way of War: Theory and Practice of Effects Based Operations” (Singapore: Institute of Defence and Strategic Studies, Working Paper no. 57, December 2003), 3-4.

106 See Claudio Segre, “Giulio Douhet: Strategist, Theorist, Prophet?” *Journal of Strategic Studies* 15 (Sept 1992), 351-66 for a summary of Douhet’s theories.

107 These issues are discussed in detail in Phillip S. Meilinger, ed. *The Paths of Heaven: The Evolution of Airpower Theory* (Maxwell AL: Air University Press, 1997), Chapters 1-8.

108 Ho, “The Advent of a New Way of War,” 5-10.

In general terms, EBO focuses on causal explanations to see if actions that are planned or taken actually result in the desired effects. The key to achieving success with EBO is in predicting how physical actions can result in behavioural outcomes. In many ways EBO is a new way of describing an old concept because it has been at the heart of theories of air warfare since the earliest air power theorists who were almost always concerned with the effects as much as the means of applying air power. In fact, Douhet's theories were based on the notion of using the physical action of bombing to effect behavioural changes in the leadership of a nation. Critics of EBO have, therefore, used the failures of air power theorists to accurately predict the outcomes (effects) of aerial bombardment to illustrate why true EBO may not be possible.¹⁰⁹ Some of these criticisms are based on the chaotic nature of warfare and the fact that Chaos Theory tells us that second and third order effects, especially those associated with human behaviour, cannot be predicted with the accuracy necessary to achieve the results EBO enthusiasts have claimed.¹¹⁰

While acknowledging non-combat aspects of EBO, some in the US Air Force still present it as largely a targeting exercise. For example Colonel Gary L. Crowder, the Chief of Strategy, Concepts and Doctrine of the US Air Force's Air Combat Command, in an article purporting to represent the US Air Force approach to applying air power, focuses on the effects of new precision-guided munitions in executing EBO.¹¹¹ Those who favour this targeting approach to EBO have claimed that the initial "Shock and Awe" bombing campaign in Operation IRAQI FREEDOM (OIF) was an example of Rapid Decisive Operations (RDO). The "Shock and Awe" concept comes from a 1996 paper written by military strategists Harlan Ullman and James Wade titled "Shock and Awe: Achieving Rapid Dominance."¹¹² The theory appears to be very Douhetian in its concept of destroying the enemy's will to resist by imposing "the non-nuclear equivalent of the impact of the atomic bombs dropped on" Japan, and very ambitious in its desire to: "...control the environment and to master all levels of an opponent's activities...resistance would be seen as futile." To many this prescription seemed to fit the description of what was attempted by air forces in the early stages of OIF. Ullman, however, stated that the air campaign in OIF "appears to come out of a book by strategic-air-power advocates, who have argued that you start at the center and work your way out to disrupt and destroy whatever," but that it was not what he envisaged as shock and awe.¹¹³ This example of different interpretations of the shock and awe concept demonstrates once again the problem with a number of current theories of war—they are, as noted earlier, still hazy, ill defined, and subject to different interpretations.

Critics of approaches to EBO that concentrate on targeting as a means of achieving outcomes caution that studying the theoretical foundations and historical examples of this

109 There is an extensive literature on this topic. See for example Segre, "Giulio Douhet: Strategist, Theorist, Prophet?"; Robert A. Pape, *Bombing to Win: Air Power and Coercion in War* (Ithaca, NY: Cornell Univ Press, 1996); and W. Hays Park, "'Precision' and 'Area' Bombing: Who Did Which, and When?" *Journal of Strategic Studies* 18 (March 1995), 145-74.

110 See for example John F. Schmitt, "Command and (out of) Control: The Military Implications of Complexity Theory," *Marine Corps Gazette* 82, no. 9 (September 1998), 55-8; John D. Hall, "Decision making in the information age: moving beyond the MDMP military decision-making process," *Field Artillery* (September-October 2000), 28-32; and Christian Rousseau, "Commanders, Complexity, and the Limits of Modern Battlespace Visualization," unpublished paper written for AMSC 5, CFC, 2002, wps.cfc.dnd.ca/papers/amsc/amsc5/rousseau.pdf. Accessed 29 Nov 2006.

111 Gary L. Crowder, "Effects-Based Operations: The Impact of Precision Strike Weapons on Air Warfare Doctrines," *Military Technology* 27 no. 6 (Jun 2003), 16-25.

112 Harlan K. Ullman and James P. Wade, *Shock and Awe, Achieving Rapid Dominance* (1996) available at manybooks.net/titles/ullmanhaetext05skawe10.html. Accessed 29 Nov 2006.

113 Excerpt from "Introduction," Harlan Ullman and James Wade "Shock and Awe: Achieving Rapid Dominance" in *Washington Post* (30 Mar 2003), p. B03.

type of EBO proves its futility as an approach to conducting operations. They note that attempts to destroy an enemy's will to resist without destroying all of their infrastructure and without physically occupying the territory, such as was attempted in the strategic bombing campaigns of the First and Second World Wars, failed, and that strategic bombing theories, like those of Douhet and Warden, have underestimated the obstacles to achieving their goals. As for the recent shock and awe variant of EBO theory, Kagan asserts that those who advocate this approach to warfare ignore the fact that the destruction of targets and resultant killing of civilians necessary to achieve the desired effect may undermine the political objectives of the campaign.¹¹⁴ The challenge for champions of EBO will be to see if modern theories, methods of analysis, and technology can make true EBO possible.¹¹⁵

A number of advocates of NCW have recently portrayed EBO as an adjunct to the theory of NCW; however, proponents of EBO would argue that EBO focuses on outcomes more than NCW, which focuses on inputs, i.e., the network. For proponents of EBO, networks are enablers for EBO and should not be seen as the primary consideration in devising new ways of conducting war and other operations.

Whatever their differences, proponents of both EBO and NCW have focussed on the technical rather than the human dimension of war. Many commentators have identified the need for more attention to be paid to the human dimension of EBO, but the complexity of this effort has been equated to "PhD level warfare."¹¹⁶ However, like NCW, confusion over what EBO really means has led to a situation where "the concept is neither thoroughly nor evenly understood among military people" and as a result, "[o]nly now is EBO being tentatively and unevenly incorporated into service and joint doctrine."¹¹⁷ Until a fully developed theory of EBO is validated, however, it will be an uncertain guide for transformation initiatives.

Once again, we see that a number of "theories" of war, such as EBO, RDO, "shock and awe," are evolving concepts that should be used carefully and subject to more debate and research before they are accepted wholeheartedly as the foundation of any major changes to armed forces.

Networks and Air Forces. While Western navies focussed on tying their ships together more closely with electronic networks at the end of the 20th century, air forces had already achieved this type of networking, especially in air defence operations. The earliest networked system, in a modern sense, was arguably the British air defences developed during the First World War to counter the attacks of first German Zeppelins and then fixed-wing bombers.¹¹⁸ Brigadier General E.B. Ashmore commanded an integrated air defence system that was comprised of an observer corps, searchlights, anti-aircraft artillery, and fighters all linked by a sophisticated communications network (by First World War standards) that permitted control centres to co-ordinate the activities of the system. By November 1918,

¹¹⁴ Kagan, "War and Aftermath," 5-8.

¹¹⁵ For a discussion of this issue see Christopher D. Kolenda, "Transforming How We Fight: A Conceptual Approach," *Naval War College Review* 56, no. 2 (Spring 2003), 100-21.

¹¹⁶ Ho, "The Advent of a New Way of War," 23-4.

¹¹⁷ Edward Mann, Gary Endersby, Tom Searle, "Dominant Effects: Effects-Based Joint Operations," *Aerospace Power Journal* 15, no. 3 (Fall 2001), 92-100, www.airpower.maxwell.af.mil/airchronicles/apj/apj01/fal01/vorfal01.html. Accessed 29 Nov 2006.

¹¹⁸ The fixed-wing bombers were Gothas and *Riesenschiffe* (Giants). The Giants had 6 engines, a wingspan of 140 feet, carried a crew of 9, had a maximum bomb load of 2 tons, and could fly 600 miles non-stop. Raymond Fredette, *The Sky on Fire: The First Battle of Britain and Birth of the Royal Air Force* (Washington D.C.: Smithsonian Institution Press, 1966), 6-7.

this system involved 20,000 personnel, more than 500 guns, 600 searchlights, and 16 fighter squadrons.¹¹⁹

By the standards of the day, this was a highly innovative network. Early warning was improved by cutting huge double discs and by placing concrete mirrors into the English Channel cliffs to gather the sound from approaching bombers, and with practice operators reportedly could locate the bearing of approaching enemy aircraft up to 24 kilometres out. Emphasis was also placed on using directional sound devices for aiming searchlights and guns.¹²⁰ In less than two years the British had developed a system that was quite effective in providing a common operating picture according to Ashmore's own account:

I sat overlooking the map from a raised gallery. In effect, I could follow the course of all aircraft flying over the country as the counters crept across the map. The system worked very rapidly. From the time an observer at one of the stations in the country saw a machine over him, to the time when the counter representing it appeared on the map, was not, as a rule, more than half a minute. In front of me a row of switches enabled me to cut into the plotters lines, and talk to any subordinate commanders at the sub-controls.¹²¹

While radar and air-to-ground radio were to improve the performance of subsequent air defence organizations, Ashmore's system was the template for them. The British air defence system used in the Battle of Britain, the German air defence system deployed after 1940 to protect continental Europe, and the North American air defence system built during the Cold War were all highly networked systems along the Ashmore model.

However, from a theoretical perspective, air forces preferred the offence to the defence, and, as we have seen, have preferred to concentrate their theoretical attention not on defensive networked systems but on the outcomes that could be achieved by strategic attack. Although guilty in the past of focussing their force structure planning on technology, platforms, and inputs,¹²² air forces now favour outcomes-based theories like EBO that fit better into the air force portion of joint operations. This new focus was articulated recently in an essay in the *RAF Air Power Review* which stated that the "key to the synergy of the joint force" is EBO, and the mechanism to achieve that synergy is the Air Operations Centre (AOC).¹²³ For air forces then, networks are a necessary enabler, but they are secondary to the main focus, which is *what* is achieved not *how* it is achieved. For some, focussing on networks rather than effects is a step backward along a road of conceptual development based on EBO.

Another problem with the current theory of NCW from an air force perspective, is its emphasis on self-synchronization and mission command or command-by-influence.¹²⁴ Synchronization as a concept of operations is emphasized more by land forces than air forces. In comparing US Air Force and US Army doctrine it can be seen that the US Air Force focuses on the integration of air power across the entire joint theatre of operations,

119 James D Crabtree, *On Air Defense* (Westport Ct.: Praeger Publishers, 1994), 32-3; and John A. English, *Marching Through Chaos: The Descent of Armies in Theory and Practice* (Westport, CT: Praeger, 1996), note 8, 141.

120 Crabtree, *On Air Defense*, 31-2.

121 Crabtree, *On Air Defense*, 212.

122 The best description of the US Air Force's theoretical evolution from a cultural perspective is Carl H. Builder, *The Icarus Syndrome: The Role of Air Power Theory in the Evolution and Fate of the US Air Force* (London: Transaction Publishers, 1994). See also Harold R. Winton, "A Black Hole in the Wild Blue Yonder: the Need for a Comprehensive Theory of Air Power," *Air Power History* 39 (Winter 1992), 32-42 for the lack of a theoretical focus in the US Air Force prior to the Gulf War.

123 Stephen Fought, "The Tale of the C/JFACC: A Long and Winding Road," *RAF Air Power Review* 7, no. 4 (Winter 2004), 10-11.

124 US DoD, Office of Force Transformation, *The Implementation of Network-Centric Warfare*, ii.

whereas the US Army tends to think geographically and emphasizes the synchronization of actions in time and space. It has been argued that the Army approach contrasts with the more holistic US Air Force perspective that focuses on the effects that massing forces through integration can achieve.¹²⁵

In an NCW context Roddy notes that Cebrowski originally defined self-synchronization as “the ability of a well informed force to organize and synchronize complex warfare activities from the bottom up.” And that more recently it has been suggested that “self-synchronization ‘calls for lower-level decision makers to be guided only by their training, understanding of the commander’s intent, and their awareness of the situation in relevant portions of the battlespace,’” and that “[s]elf-synchronization emerges when units within a force use common information, the commander’s intent, and a common rule set – or doctrine – to self-organize and accomplish the commander’s objectives.”¹²⁶

At fairly low tactical levels when close co-ordination among many air assets is not essential and when threat levels are low, self-synchronization and command-by-influence can be employed by air forces; however, in other circumstances these processes can be problematic. For example, when decisions have enormous political consequences, such as the release of nuclear weapons or shooting down civilian aircraft, decision making will be retained at the highest levels, and one would be hard pressed to imagine a plausible scenario where these types of decisions would be susceptible to self-synchronization or command-by-influence processes.¹²⁷ A recent *Joint Force Quarterly* article put it this way:

Because of casual linkages among target sets and the danger of objective fratricide, effects based operations must be orchestrated by a centralized planning and execution authority that has situational understanding of every aspect of the diplomatic, informational, economic, and military campaign.¹²⁸

In other circumstances, such as when large air forces need to conduct operations against a enemy with some credible air defence capability, neither self-synchronization nor command-by-influence are likely to be of much use except for short periods of time at the lowest tactical levels. For example, in Operation ALLIED FORCE, an air campaign against a very weak state but one with some air defence capability, complicated command and control arrangements were necessary to co-ordinate the activities of hundreds of air assets down to the minute (or less). The idea of allowing the vast number of air assets involved in such operations to self-synchronize or to employ command-by-influence is difficult to imagine. One author notes that to achieve unity of effort “the realities of modern joint air operations... require centralized planning and direction” at “the highest levels.”¹²⁹ Crowder tells us that a critical element in achieving unity of effort while executing EBO, from an air force perspective, is the Air Tasking Order which provides “a common command and control architecture for all the air players that are involved.”¹³⁰ The nature of complex air operations suggests that, while there may be limited opportunities

125 Gerald M. Pratt, “A Clash of Service Doctrines: Integration Versus Synchronization in Joint Operations” unpublished paper written for AMSC 5, CFC, 2002, wps.cfc.dnd.ca/papers/amsc/amsc5/pratt.pdf. Accessed 29 Nov 2006.

126 Kimberly A. Roddy, “Network-Centric Operational Warfare: The New Science of Operational Art,” unpublished research paper, (Newport RI: Naval War College, 16 May 2003), 9.

127 For example, decisions related to a recent intrusion of a civilian aircraft into restricted air space over Washington, DC involved the US Secretary of Defense. Spencer S. Hsu and John Mintz “Military Was Set to Down Cessna: Authority Granted as Plane Strayed Deep Into Capital,” *Washington Post*, 25 May 2005, A01.

128 Mark G. Davis, “Centralized Control / Decentralized Execution in the Era of Forward Reach,” *Joint Force Quarterly*, no. 35 (Autumn 2004), 98-9.

129 Mark G. Davis, “Centralized Control / Decentralized Execution in the Era of Forward Reach,” 98.

130 Crowder, “Effects-Based Operations: The Impact of Precision Strike Weapons on Air Warfare Doctrines,” 16-25.

for self-synchronization and command-by-influence processes, for the foreseeable future air forces will rely on command-by-plan to execute their missions. There are, therefore, unique aspects to employing air power that make NCW's emphasis on synchronization and mission command inappropriate from an air force point of view.

If the principle of self-synchronization seems difficult to apply to air forces, dependant as they are on command-by-plan as represented by Air Tasking Orders produced by discrete organizational structures like the AOC, the idea of a self-organizing system seems almost beyond the realm of plausibility.

Therefore, air forces today and in the foreseeable future will rely on command-by-plan, and in certain cases, such as when a command decision could have important political repercussions, even command-by-direction. While air force C² organizations and related joint organizations depend on networks to accomplish their tasks,¹³¹ the network is not the focus; it merely enables the activity—EBO.

Conclusions. NEOps seems poised to become the driving concept behind CF transformation for a number of reasons, not the least of which is Canada's tendency to follow the American lead in new concepts related to war and other operations. This part of the chapter examined NEOps and its progenitor, NCW, and concluded that Canada and the CF should be cautious about using NCW, a concept that was developed in a certain context to meet certain needs, as the basis for NEOps, because that context and those needs may not be congruent with Canadian requirements.

While the notion of networked operations has been embedded in the conceptual approaches to operations of a number of militaries, recently a specific variant, NCW, has come to dominate the debate on change and transformation and it is being used as a template for future American command and control frameworks. This domination came about not because of any overwhelming empirical evidence or because of its wide-ranging practical virtues, but because it was imposed on the US Office of Transformation by one of its leading advocates, the late Arthur Cebrowski. As we have seen, however, there is still considerable confusion as to what the concept of NCW actually entails because the concept itself has been evolving over the past seven years and because of its arcane language. Furthermore, as the concept has evolved, it has moved well beyond its naval roots and incorporated a number of models from other domains, for example, EBO, information age warfare, mission command (or command-by-influence), manoeuvre, and elements of the OODA (Observe, Orient, Decide, Act) loop, which are not necessarily compatible with the original NCW construct and which are not always well articulated or described themselves. This has caused a great deal of confusion in the debates on NCW-driven transformation and, unfortunately, this confusion has been glossed over in a number of official publications. This conceptual confusion is exacerbated by the fact that even "transformation" is not clearly defined by those in charge of these efforts in the US today.

While some in the US Air Force still present EBO as largely a targeting exercise, more sophisticated variants of EBO have now been incorporated into NCW, joint doctrine and other concepts like Rapid Decisive Operations and "Shock and Awe." Like NCW itself, the notion of EBO is still poorly understood and subject to different interpretations as we know that there is no universally accepted theory of EBO and at least six different variants now co-exist. Furthermore, EBO's critics note that in the past it has not lived up to its promises. They point out that the chaotic nature of warfare makes it almost impossible to predict,

131 Fought, "The Tale of the C/JFACC...", 10-11.

with the accuracy necessary to achieve the results EBO enthusiasts have claimed, how various actions will achieve the desired second and third order effects, especially those associated with human behaviour.

Even if EBO is not a fully functional theory of war, Western air forces have adopted it as the guiding principle for integrating air operations into joint operations. Building on their experiences in the Gulf War in the early 1990s, Western air forces have created an elaborate C² system based on the Air Operations Centre to co-ordinate all aspects of air operations for the joint force commander. However, the air force approach to C² is largely incompatible with some of the C² concepts now being articulated in NCW policy documents, particularly self-synchronization, self-organization, and mission command or command-by-influence.

Given the nature of complex air operations, while there may be limited opportunities for self-synchronization and command-by-influence processes, for the foreseeable future air forces will rely on command-by-plan to execute their missions. However, in some circumstances, for example, when decisions could have enormous political consequences, such as the release of nuclear weapons or the shooting down of civilian aircraft, air forces will likely continue to use command-by-direction. And because of the type of C² structures air forces require to co-ordinate all aspects of a complex air campaign, the idea of a self-organizing system seems implausible. Therefore, due to the environment in which they operate, air forces today and in the foreseeable future will likely rely on command-by-plan and sometimes command-by-direction rather than command-by-influence.

Despite the attempt of some advocates of NCW to portray EBO as part of the theory of NCW, proponents of EBO might argue that NCW should be seen as an enabler of EBO, not vice versa. The experience of air forces is that networks are required to enable their operations, but that the network should not be the primary consideration. In fact, from an air force perspective, the focus of NCW on inputs (the network) as opposed to outcomes (as proposed by EBO theories) could be seen as a step backward on the path to progress in theories of war.

Rethinking “Centralized Command and Decentralized Execution”¹³²

Another concept that has gained wide prominence in air force discussions on C² is “centralized command and decentralized execution.” The following edited excerpts from an essay from the proceedings of the 2002 Air Symposium on Air Force Command and Control challenge some of the assumptions behind the term and urge air force leaders to re-assess their use of this concept as a key principle of air force C².

The Canadian Air Force has adopted the mantra of “centralized command and decentralized execution” to encapsulate its command and control philosophy. Yet on closer examination, this slogan does not really describe the actual C² processes used by the Air Force either today or in the past. Furthermore, this expression, while widely used by those describing air force C², is not well understood. For example, at the 2002 Air Symposium held at the Canadian Forces College, some participants used the expressions “centralized command and decentralized execution” and “centralized control and decentralized execution” almost interchangeably, and, when pressed to explain the differences between the two expressions, were unable to do so in a convincing manner.

¹³² This section of this chapter consists of edited excerpts from Allan English, “Rethinking Centralized Command and Decentralized Execution” in Douglas L. Erlandson and Allan English, eds., *Air Force Command and Control* (Toronto: Canadian Forces College, 2002), 71-82.

Much of this confusion with the use of the expression stems from the Canadian Forces Aerospace Doctrine manual, *Out of the Sun*, which does not clearly explain the concepts of command, control, and execution in this context.¹³³ It should be noted that the latest (2006) draft of “Canadian Aerospace Doctrine” continues to use the term “centralized command and decentralized execution” without any convincing explanation of why it should be one of the guiding C² principles for aerospace forces. Part of the reason for the confusion can also be explained by a lack of precision in the terms used to describe C² in the CF and other Western armed forces. Definitions are often circular and the same words are defined differently by different users.¹³⁴ Perhaps the most disconcerting aspect of the use of this expression is when it is employed to foreclose discussion about alternative air force C² arrangements. This occurs when “centralized command and decentralized execution” is portrayed as the only viable C² philosophy for the air force.

It is argued here that the expression “centralized command and decentralized execution” is an imprecise and inaccurate description of how air forces exercise C², and that alternate ways, based on a clearer understanding of the terms in the expression, should be investigated to optimize C² in the air force in the 21st century.

In order to evaluate the expression properly, useful definitions are required. I have selected those put forward by Pigeau and McCann for the reasons given above. In the context of this discussion there seems to be general consensus that command in the air force should be centralized as much as possible. Unlike the army, which advocates a mission-oriented command philosophy devolving command functions to the lowest practicable level, air forces tend to favour concentrating most command functions at higher levels. One rarely hears air force officers advocating “decentralized command and decentralized execution.” While air forces recognize that some C² functions should be decentralized in their operations, this is usually articulated as “decentralized execution.” But what does this expression really mean?

Neither Canadian nor US Air Force doctrine has defined “decentralized execution” clearly. *Out of the Sun* does not define the term, but it tells us that decentralized execution is “essential” and that it is accomplished by, “delegating appropriate authority to execute missions and tasks” to “subordinate commanders.”¹³⁵ The 1997 version of AFDD-1 also does not define the term, but, in describing “decentralized execution,” tells us that “[d]elegation of execution authority to responsible and capable lower-level commanders is essential to achieve effective span of control and to foster initiative, situational responsiveness, and tactical flexibility.”¹³⁶ The latest version (2003) of AFDD-1 tells us that “centralized command and decentralized execution” are “fundamental organizing principles” that “are critical to effective employment of air and space power,” and, using almost the same wording as the 1997 version, it defines “decentralized execution” as “...the delegation of execution authority to responsible and capable lower-level commanders to achieve effective span of control and to foster disciplined initiative, situational responsiveness, and tactical flexibility.”¹³⁷

133 See for example, *Out of the Sun: Aerospace Doctrine for the Canadian Forces* (Winnipeg, MB: Craig Kelman & Associates, [1997?]), 38-39, where, when explaining “key principles” no distinction is made between command and control.

134 Ross Pigeau and Carol McCann, “What is a Commander?” in Bernd Horn and Stephen J. Harris, eds., *Generalship and the Art of the Admiral: Perspectives on Canadian Senior Military Leadership* (St Catharines, ON: Vanwell Publishing, 2001), 80-3.

135 *Out of the Sun*, 38

136 *Air Force Basic Doctrine*, AFDD-1, (Sep 1997), 23. The latest (2006) draft of “Canadian Aerospace Doctrine” uses wording very similar to the 1997 version of AFDD-1 to describe “decentralized execution.”

137 *Air Force Basic Doctrine*, AFDD-1, (Dec 2003), 34-5.

As Pigeau and McCann have noted, all of these descriptions and definitions fit into the categories of inchoate, circular and redundant. Their use conflates the separate functions of command, control, and execution and serves only to confuse many who use the air force C² mantra. If one accepts that the functions of command, control, and execution are separate and distinct activities then “execution” should be used in its normal context of carrying out the mission.¹³⁸ The delegation of authority is a different activity and, as we shall soon see, should be described by another term. If we accept the definition of “execution” in its most common sense of carrying out the mission, we can see that air forces today practice decentralized execution because those assets or resources carrying out the mission are almost always separated in space and time from the commander who is responsible for their use.

However, in order to understand the concept of decentralized execution more clearly, it is worth looking at how centralized execution, its logical opposite, might work. This can be illustrated by imagining what “centralized command and centralized execution” might look like. In this case the commander and the means of carrying out the commander’s intentions would be physically co-located. In the not-too-distant future an aerospace commander might be co-located with a space-based or airborne directed energy weapon and be able to personally employ the weapon—this is true centralized execution. Until that day dawns, I would argue that the real debate in the C² of air force assets is between centralized and decentralized control.

Using Pigeau and McCann’s framework and definitions we can see why. They define control “as those structures and processes devised by command to enable it and to manage risk.” They then provide the following elaboration:

The function of control is to enable the creative expression of will and to manage the mission problem in order to minimize the risk of not achieving a satisfactory solution.

The function of command is to invent novel solutions to mission problems, to provide conditions for starting, changing and terminating control, and to be the source for diligent purposefulness.

From this explanation flow the actions associated with command and control. Controlling involves such activities as “monitoring, carrying out and adjusting processes that have already been developed” according to pre-established plans. Commanding, on the other hand, involves “creating new structures and processes (i.e., plans, SOPs, etc.),” initiating and terminating control, making unanticipated changes to plans, and modifying control structures and processes as required.¹³⁹

Pigeau and McCann also argue that commanders harness command potential by imposing control on the expression of command, and that there will always be a tension between command creativity and the requirement to limit creativity in a complex military organization if the effective co-ordination of activities is to take place.¹⁴⁰

Based on this framework we can see that the term “execution,”—as used in US Air Force and CF aerospace doctrine to mean delegating the appropriate authority to execute missions and tasks to lower-level commanders—when used in the expression “centralized command and decentralized execution” really describes control rather than execution. The key issue then in this discussion is, given the ability to exercise greater degrees of control, how much control should higher commanders delegate to lower level commanders. It is recognized

¹³⁸ *Oxford English Dictionary*, sixth ed., (1980), 362.

¹³⁹ Pigeau and McCann, “Re-conceptualizing Command and Control,” 56.

¹⁴⁰ Pigeau and McCann, “What is a Commander?” 83.

that commanders at all levels perform some command functions, but it will be argued here that the ability for lower level commanders to exercise their creative will to accomplish the mission has been closely circumscribed in modern air forces.

Historical Context. A short historical example of the evolution of air force C² will provide a background against which current trends can be evaluated. I have chosen some examples from the British flying services because they have the longest history of the C² of an independent air service. The Royal Flying Corps began the First World War with a somewhat centralized C² system. Most force generation issues were handled by the War Office, and beginning in January 1918, by the Air Ministry, in London. Force employment was the purview of different theatre headquarters (HQ), the largest located in France. At first control structures and processes were weak as the HQs were very small and did not have the capability to exercise strong centralized control. There was virtually no body of written air doctrine in existence and local initiatives and experience guided the application of air power in those early days of powered human flight. Missions were passed by the theatre HQ directly to squadrons who had a great deal of latitude in planning and executing the missions. As the size of air forces increased, for example the British air services grew and evolved from just over 2,000 men in 1914 into the Royal Air Force with over 290,000 men and women in uniform in 1918,¹⁴¹ more control mechanisms were required. These developed in the form of an increasingly formalized written doctrine, plans, and SOPs and more complex control structures involving the organization of air resources into wings and brigades¹⁴² which exercised command and control over what had been semi-autonomous squadrons. By the end of the war as many as 2,000 aircraft from different nations could be employed in offensive operations, for example, at the battle of Amiens (8 August 1918). To deal with this complexity new C² arrangements were therefore devised, with Canadians among the pioneers in these innovations,¹⁴³ so that by 1918 the RAF had created a relatively sophisticated C² system by the standards of the day.¹⁴⁴

As often happens after great wars, much of the C² knowledge acquired during the First World War was lost in the inter-war years. The small size of the RAF dictated a return to small and relatively simple C² arrangements with the fewer higher HQs and a lack of resources leading to a more decentralized control process. Squadrons deployed around the British Empire, in locations as remote to the United Kingdom as Singapore, India, and the Middle East, exercised considerable autonomy in day-to-day operations.¹⁴⁵ In the late 1930s, as the size of the RAF increased, C² systems became more complex again, most notably in Fighter Command, based on the First World War system created to defend London against raids by German airships and bombers (described above).¹⁴⁶ Bomber Command also instituted

141 H.A Jones, *War in the Air, Appendices*, (Oxford: Clarendon Press, 1937), Appendix XXV.

142 For example, in 1918 VIII Brigade consisted of three wings, each wing comprising two or three squadrons, Jones, *War in the Air, Appendices*, Appendix XV, 87.

143 S.F. Wise, *The Official History of the Royal Canadian Air Force. Vol. 1: Canadian Airmen and the First World War* (Toronto: Univ. of Toronto Press, 1980), 520.

144 Many descriptive accounts of the exploits of British and Canadian airmen in the First World War have been published, for example Wise, *Canadian Airmen and the First World War*; Lee Kennett, *The First Air War* (New York: The Free Press, 1991); Walter Raleigh and H.A. Jones, *War in the Air* (Oxford: Clarendon Press, 1922-1937), 6 vols. and appendices; Denis Winter, *The First of the Few* (Athens, Georgia: Univ. of Georgia Press, 1983). C² issues are described to a certain extent in Maurice Baring, *Flying Corps Headquarters 1914-1918* (London: Blackwood, 1968); Andrew Boyle, *Trenchard* (London: Collins, 1962); Basil Collier, *Heavenly Adventurers: Sefton Brancker and the Dawn of British Aviation* (London: Secker & Warburg, 1959); and Raymond H. Fredette, *The Sky on Fire* (New York: Holt, 1966).

145 David E. Omissi, *Air Power and Colonial Control: The Royal Air Force, 1919-1939* (Manchester: Manchester Univ. Press, 1990) provides an excellent description of this era.

146 After the First World War the RAF had been reduced to fewer than 30,000 personnel. Phillip S. Meilinger, "Trenchard, Slessor, and Royal Air Force Doctrine before World War II," in Phillip S. Meilinger, ed. *The Paths of Heaven* (Maxwell Air Force Base, Ala.: Air University Press, 1997), 47. By October 1944 the RAF numbered 1,171,421 all ranks. John Terraine, *The Right of the Line* (London: Hodder and Stoughton, 1985), 535.

more complex C² arrangements. Its raids early in the war, consisting of small numbers of aircraft,¹⁴⁷ were executed by squadrons that often planned many of the details of the raids independently. However, as the size of the raids increased, culminating in the 1000-plane raids which began in 1942, where bomber, fighter, air defence, electronic warfare and other resources had to be co-ordinated, control became more centralized. Groups and wings provided closer control of squadrons, but the number and dispersed nature of the bomber forces left some latitude to squadrons in planning their missions. Written doctrine, which had been studied in some detail during the inter-war years proved to be of limited use during the war,¹⁴⁸ and it evolved in a semi-formal way with higher HQs codifying practices that had been found effective in combat, sometimes with the help of operations researchers.¹⁴⁹

The example of the Second World War shows a pattern similar to the First World War for changes to C² arrangements. At first small higher HQs exercised relatively little control over squadrons, because they did not have the resources, processes, or structures in place to exercise closer control. As the size of the air forces increased, the higher HQs used increasingly complex processes and structures, including more subordinate HQs, to exercise closer control of their assets. While it could be argued that more HQs was an indication of decentralized control, in this context the increased number of intermediate HQs was used to increase the influence of central HQs, like Bomber Command, over squadrons that early in the war had more autonomy in executing operations than later in the war. I would argue, therefore, that in both wars control became increasingly centralized to effect the co-ordination of increasingly larger air forces.

This same trend can be seen in more recent air operations. The air C² arrangements in the Gulf War (1990–91) showed a system in transition between the types of systems used in the Second World War and those used today. While the technology certainly permitted air commanders in the Gulf War to exercise closer control of their forces, the overall system would be recognizable to many veterans of Bomber Command. The Air Tasking Order (ATO) process used in the Gulf imitated a process similar to the one Bomber Harris used in his assault on Fortress Europe and in subsequent attacks when the United States Army Air Forces joined the Commonwealth bomber forces to mount the Combined Bomber offensive.¹⁵⁰ Since then, aerospace forces have been subjected to even closer command and control.

Two recent Western air campaigns, Operation ALLIED FORCE and air operations both in the continental defence of North America and in Afghanistan, have demonstrated that

147 Generally just a handful at a time, but rarely more than 30, up to 1940. See Martin Middlebrook and Chris Everitt, *The Bomber Command War Diaries* (London: Penguin, 1990) for details of the raids.

148 See for example, Tami Davis Biddle, "British and American Approaches to Strategic Bombing," *Journal of Strategic Studies* 18 (March 1995), 91-144; and Allan D. English, "The RAF Staff College and the Evolution of British Strategic Bombing Policy 1922-29," *Journal of Strategic Studies* 16, (September 1993), 408-31.

149 The story of the RAF and RCAF, including Bomber Command's exploits, has been told well in a number of books, notably Terraine, *The Right of the Line*; Brereton Greenhous, et al. *The Official History of the Royal Canadian Air Force. Vol. 3: The Crucible of War 1939-1945* (Toronto: Univ. of Toronto Press, 1994); Charles Webster and Noble Frankland, *The Strategic Air Offensive Against Germany 1939-1945* (London: HMSO, 1961), 4 vols. Sir Arthur ("Bomber") Harris' role in these events is described in Arthur Harris, *Bomber Offensive* (London: Collins, 1947); Charles Messenger, *"Bomber" Harris and the Strategic Bombing Offensive, 1939-1945* (London: Arms and Armour Press, 1984); Dudley Saward, *"Bomber" Harris* (London: Cassell, 1984). However, no detailed analysis of Bomber Command's C² system has been published.

150 A great deal has been written on the Gulf War. Some of the better sources on C² are Mark D. Mandeles, Thomas C. Hone, and Sanford S. Terry, *Managing "Command and Control" in the Persian Gulf War* (Westport, CT: Praeger, 1996); and Richard T. Reynolds, *Heart of the Storm: The Genesis of the Air Campaign Against Iraq* (Maxwell AFB, Alabama: Air University Press, 1995). One of the few detailed analyses of an aspect of Canadian Air Force C² in the Gulf War can be found in Jean Morin, "The Command and Control of the Air Transport Group during the Gulf War," in *Proceedings, 3rd Annual Air Force Historical Conference* (Winnipeg: 1 Canadian Air Division, History and Heritage, 1998), 117-24. A more general analysis of Canadian C² in the Gulf War can be found in Jean Morin and Richard H. Gimblett, *Operation Friction, 1990-1991: The Canadian Forces in the Persian Gulf* (Toronto: Dundurn Press, 1997).

commanders at the highest level can now exercise close control over aerospace assets, much more so than could be exercised over air forces in the past or by the army and navy today. It has come to the point where a four-star general can see what is happening in an individual cockpit and direct a pilot personally. This has severely limited the authority of aircrew and their immediate commanders in carrying out the functions of control, or command.

Some have described the air campaign in Afghanistan as unique and it has highlighted some problems of the trend to more centralized control of air assets. Unlike the Gulf War, where US military commander, Norman Schwarzkopf, had his HQ in the theatre of operations, in the Afghanistan campaign Central Command, the major US HQ responsible for prosecuting the war, was 7,000 miles from the theatre of operations. On the other hand, the Combined Air Operations Center, responsible for running the air war, was located in Saudi Arabia. A recent report on this command arrangement has identified a number of problems with it. The most troubling appears to be that “instant communication” has allowed Central Command to exercise extremely close control over not only deployed HQs but also all the forces in theatre, and that is seen by some as severely restricting local initiative.¹⁵¹ Meilinger argues that the technology now exists to conduct either a centralized control - centralized execution or decentralized control - decentralized execution air campaign, but that the C-in-C Central Command, Tommy Franks, has opted for the former, using his staff rather than component commanders to exercise control over aerospace resources.¹⁵²

Another trend—the lethality of weapons—has also had a direct effect on the C² of aerospace forces.¹⁵³ Now a handful of aircraft, or in certain cases even one platform, can accomplish with precision guided munitions what it took hundreds of bombers to achieve in the Second World War.¹⁵⁴ This trend plus “instant communication” have allowed aerospace commanders to do something Bomber Harris could not do—personally monitor the execution of an entire mission. Today’s aerospace commander is in a position to exercise extremely close control, to the point of personally authorizing weapons release against all the targets in a mission. Doctrinally the US Air Force supports this trend, declaring that the historical record proves that “centralized control [is] the best way to effectively employ airpower.”¹⁵⁵

This new capability has been interpreted by some as “centralized execution.”¹⁵⁶ I would disagree, based on the previous discussion. Execution of the mission is still decentralized, because the platforms executing the mission are physically remote from the commander,

151 Thomas E. Ricks, “Un-Central Command Criticized: Marine Corps Report Calls Fla. Headquarters too far from Action,” *Washington Post* (3 Jun 2002), A01.

152 Phillip S. Meilinger, “Preparing for the Next Little War: Operation Enduring Freedom Points to New Ways of Warfighting,” *Armed Forces Journal International* (April 2002), p. 2 of 5 (internet version www.afji.com/AFJI/Mags/2002/April/preparing_2.html). Accessed 29 Nov 2006.

153 A growing literature is emerging on the effects of precision weapons on air warfare. Some sources that provide a perspective related to this discussion and Operation ALLIED FORCE are Michael Ignatieff, *Virtual War: Kosovo and Beyond* (Toronto: Viking, 2000); Peter F. Herrly, “The Plight of Joint Doctrine after Kosovo,” *Joint Force Quarterly* 22 (Summer 1999), 99-104; Daniel L. Byman and Matthew C. Waxman, “Kosovo and the Great Air Power Debate,” *International Security* 24, no. 4 (Spring 2000), 5-38; Alan D. Zimm, “Desert Storm, Kosovo, and ‘Doctrinal Schizophrenia,’” *Strategic Review* 28, no. 1 (Winter 2000), 32-9; and Paul Johnston, “Canadian Hornets over Kosovo: A Small Part of a Future Model for Air Power?” in Office of Air Force Heritage & History, eds. *Proceedings of the 6th Annual Air Force Historical Conference* (Winnipeg:1 Canadian Air Division, History and Heritage, [2000?]), 113-20.

154 In the Second World War American statisticians calculated that using high level “precision bombing” techniques it required a force of 220 bombers to guarantee a hit on a target 10,000 square feet in size. W. Hays Park, “‘Precision’ and ‘Area’ Bombing: Who Did Which, and When?” *Journal of Strategic Studies* 18 (March 1995), 147.

155 *Air Force Basic Doctrine*, AFDD-1, (Sep 1997), 23.

156 See for example Benjamin S. Lambeth, “The Downside of Network-centric Warfare,” *US Air Force Aim Points* (11 Jan 2006), aimpoints.hq.af.mil/display.cfm?id=8745&printer=no. Accessed 29 Nov 2006. Originally published in *Aviation Week and Space Technology*.

and, therefore subject to some friction that would not be present with true centralized execution. The real issue, as I have argued, is the degree of control to be exercised by higher air force commanders.

In summary, air force commanders have favoured centralized control of aerospace forces during the past century for two main reasons. First, air assets are often relatively scarce, and the most effective way to use them is to pool them together under a single commander. Second, when air forces are large, operations are complex and the split-second co-ordination required to execute missions demands centralized control as exemplified by the ATO process used by most Western air forces today. In the past, when air forces were very small, HQs did not have the resources to exercise close control of geographically dispersed air assets and were content to let squadrons have a great deal of autonomy in carrying out operations. However, today, even in relatively small air forces, technology has given commanders the ability to exercise closer control with small headquarters and limited resources. This has led to a trend towards increasingly close control of aerospace forces because of the desire of commanders to be intimately involved with some missions and the technical capacity for them to do so.

As several participants in the Air Symposium remarked, this is not necessarily a bad thing. Commanders are being held increasingly accountable for every action of their forces, such as even relatively small (by Second World War standards) collateral damage, and command decisions are becoming more sensitive (for example the potential of a decision to order the destruction of a civilian airliner since the 11 Sep 2001 terrorist attacks on the US). Therefore, some believe that there are instances where very close control of air assets is warranted. On the other hand, in large air campaigns it is possible that the number of resources employed will exceed the aerospace commander's ability to personally control them and that a looser control will be appropriate.

The examples given above show some trends in the changing relationship among command, control, and execution in the C² of air forces. Command of large air forces has generally remained centralized and execution decentralized because of the nature of air assets and the environment in which they operate. I would argue that execution has become somewhat less decentralized, compared to the past, because the increased lethality and range of aerospace weapons has reduced the number of platforms assigned to a given commander and therefore reduced the need for many units to be dispersed around the world. At the same time, given the sensitivity of some of these operations commanders have chosen to exercise very close control of these platforms. Technology has permitted commanders to exercise greater control over these assets, and they have done so both because of the heightened sensitivity of some operations and because of the degree of co-ordination required to execute increasingly complex air operations. In the foreseeable future, commanders may be physically co-located with weapons systems, and, therefore would be able to exercise a maximum degree of control over these weapons. This situation would lead to perhaps the first instance in history where the execution of the aerospace mission is actually centralized. Of course, many other aerospace missions could remain decentralized in execution. Nevertheless, we should consider all possible C² eventualities.

Implications for Joint Doctrine. These trends in aerospace C² have some important implications for joint C² doctrine. First of all, they clearly show that there are significant differences between air force and army C² practices. Both the Canadian and American armies (and the US Marine Corps) have advocated a "mission oriented" command style based on

the German command philosophy of *auftragstaktik*.¹⁵⁷ While the nature of army operations favours this command style based on what is often referred to as operational art, it cannot be applied in the same way to air forces. Land forces operate in an environment that has a great deal more friction than the air environment, and, therefore it is appropriate to give even the most junior commanders a significant amount of latitude in deciding how to accomplish their missions. While land forces must co-ordinate their activities, this co-ordination is not required to the same degree as air forces where the activities of many aircraft must be co-ordinated down to literally the second. This allows lower level air force commanders much less latitude than their army colleagues in executing their missions. Rear Admiral J.C. Wylie (US Navy) put it this way: "Where the sailor and the airman are almost forced by the nature of the sea and the air, to think in terms of a total world or, at the least to look outside the physical limits of their immediate concerns, the soldier is almost literally hemmed in by his terrain." He concludes "The operational art is an artifice appropriate to ground force doctrine but the navy (and the air force) have no need for such a concept."¹⁵⁸

In the joint environment this means that, as van Creveld said, there is no "one fits all" C² system.¹⁵⁹ While some in the CF believe that it is possible to devise one method of C² for all three services, as we have seen, this is not possible. Nevertheless, there are constant pressures in the CF to create some sort of all-encompassing C² system based on a land-centric joint doctrine.¹⁶⁰ This issue continues to be debated because air forces have, until very recently, been well behind armies in doctrinal development. As US Air Force historian Richard Hallion put it: "Doctrine traditionally has been an area in which the air forces of the world have been most weak."¹⁶¹ In particular US Air Force doctrine has lagged far behind formal US Army doctrine for a number of reasons as described in James Mowbray's analysis.¹⁶² This has had a direct impact on CF aerospace doctrine because ever since the Second World War the Canadian Air Force has been particularly closely associated with the US Air Force and has adopted most of its doctrine and philosophy unreservedly.¹⁶³ Yet this carries with it serious risks. A number of Canadian and foreign officers who have studied joint doctrine extensively have cautioned us that because allied joint doctrine "contains serious flaws" and may have been written to resolve national service issues that are not necessarily problems in Canada, we should avoid the current practice of importing large amounts of unmodified foreign joint doctrine.¹⁶⁴

157 See for example Thomas J. Czerwinski, "Command and Control at the Crossroads," *Parameters* 26, no. 3 (Autumn 1996), 121-32. The Canadian army's endorsement of this philosophy is in *Land Force Command*, (21 Jul 1996), 8, available at www.army.dnd.ca/acl/pubs/. Accessed 29 Nov 2006. The fact that Western air forces have focussed on control (in the expression "centralized control and decentralized execution" found in current doctrine) and that Western armies have focussed on command may only be due to the confusion in the C² terminology used in Western armed forces. This is an area that warrants further research.

158 Wylie cited in Wayne P. Hughes, "Naval Maneuver Warfare," *Naval War College Review* 50, no. 3 (Summer 1997), 12 of 19 (internet version at www.nwc.navy.mil/press/Review/1997/summer/art2su97.htm). Accessed 29 Nov 2006.

159 Martin van Creveld, *Command in War* (Cambridge, MA: Harvard University Press, 1985), 9, 262-3.

160 F.M. Boomer, "Joint or Combined Doctrine?: the Right Choice for Canada," paper prepared for AMSC 1, wps.cfc.dnd.ca/irc/amsc/amsc1/001.html, np. Accessed 29 Nov 2006.

161 Richard P. Hallion, *Strike from the Sky* (Washington, DC: Smithsonian Institution Press, 1989), 3. See also Carl H. Builder, *The Icarus Syndrome: The Role of Air Power Theory in the Evolution and Fate of the US Air Force* (London: Transaction Publishers, 1994), 34-7.

162 James A. Mowbray, "Air Force Doctrine Problems 1926-present," *Airpower Journal* (Winter 1995), 21-41.

163 J.L. Granatstein, "The American Influence on the Canadian Military," in B.D. Hunt and R.G. Haycock, eds., *Canada's Defence* (Toronto: Copp Clark Pitman, 1993), 134-5; and Boomer, "Joint or Combined Doctrine?" np.

164 D. MacGillivray et al., "Inter-Service Cooperation: Is it the Essence of Joint Doctrine?" in David Rudd, et al., eds., *Air Power at the Turn of the Millennium* (Toronto: Canadian Institute of Strategic Studies, 1999), 192-3.

This is an important issue because historically the Canadian air force has not been able to produce coherent, up-to-date aerospace doctrine. The implications for CF joint doctrine are that without a strong and clearly articulated aerospace C² doctrine to balance extant land force doctrine, CF joint C² doctrine will continue to be based on land-centric concepts, which as we have seen, are inappropriate in many ways for the C² of aerospace forces. The principle upon which joint C² should be exercised is that each service must have its own C² doctrine and control systems, and that the joint C² arrangements must be devised to co-ordinate the effects of the various services, not to become involved in how these effects are actually executed.¹⁶⁵

Conclusions. This discussion began with the assertion that the expression “centralized command and decentralized execution” used by the Canadian and other Western air forces to describe their command and control philosophy is not only poorly understood, but also that it has hindered rigorous debate about the C² of aerospace forces in this country and elsewhere. It was argued, using the Pigeau-McCann framework for C², that the word “execution” in the expression should be replaced by “control” and that the real debate about air force C² today should be focussed around the concept of centralized command using varying degrees of control.

The C² of Western air forces over the past 90 years have changed to meet changing circumstances. Until recently, as air forces expanded, their higher HQs often used subordinate HQs, like the group and wing HQs in Bomber Command in the Second World War, to exercise closer control of forces which were relatively scarce and which needed to be co-ordinated to a much greater degree than land forces. In the 21st century aerospace commanders now have the capacity to exercise very close control over air assets without necessarily resorting to the device of intermediate HQs. At some point in the not-too-distant future commanders may even be able to directly control physically co-located weapons systems, thereby actualizing true “centralized command and centralized execution.” Yet even then aerospace force commanders will require the capability to employ decentralized control techniques to execute operations where the number of aerospace assets under their command exceeds their span of direct control.

These developments have serious implications for joint doctrine. As we have seen, air forces and land forces have C² philosophies that are fundamentally different. Therefore, current joint C² concepts based on a land-centric operational art may not be entirely appropriate for air (and naval) forces. This has serious implications for Canadian joint doctrine; however, the current state of Canadian aerospace doctrine does not yet permit any coherent contribution to this debate.

The ideas put forward here are preliminary in nature and seek to stimulate debate in an area where very little has been written. While a great deal of descriptive material has been published concerning the air operations of both World Wars, very little of an analytical nature on C² has been produced. Some analytical works concerning the C² of air resources in the Gulf War have been published, but there is still much to be done in the field of rigorous analysis of air force C² arrangements for the subsequent campaigns.

Moreover, virtually no analytical work has been done to describe how current CF joint C² systems are supposed to work let alone how they actually work. Some ideas for pursuing lines of research have been mapped out,¹⁶⁶ but beyond formal doctrine and published

¹⁶⁵ This issue is raised in a US joint context in Christopher S. Richie, “We Need Functional Doctrine,” *US Naval Institute Proceedings* 127, no. 9 (Sep 2001), 52-55.

¹⁶⁶ See for example Pigeau and McCann, “What is a Commander?” and Sharpe and English, *Principles for Change in the Post-Cold War Command and Control in the Canadian Forces*.

organization charts, we have a very limited idea of how CF joint C² really functions. As Mandeles and Reynolds have shown, it is imperative to get first hand accounts from those involved in running the systems because official documents only gives us a limited insight into C² processes.

Until we know a great deal more about these subjects, the debate about air force C² arrangements in this country will be dominated by speculation and uninformed comment. It is time to start a serious analysis of these issues in Canada and replace time-worn doctrinal slogans with sound explanations, based on rigorous definitions, of how Canadian aerospace C² really works now and how it should work in the future.

Part 5 – Concluding Material

Key Issues in Air Force Command and Leadership

Current problems in Air Force C² have their origins in the historical experience of Canada's air forces. In both World Wars Canadian air force officers had almost no operational command experience above the tactical level. The postwar RCAF provided some higher operational command experience for senior air officers, but these opportunities were severely curtailed with unification in 1968. The creation of Air Command as the central headquarters for CF air resources and the formation of functional air groups in 1975 provided the opportunity for senior air force officers to exercise higher command within an air force C² framework once again. These opportunities were curtailed, however, with the disbandment of the air groups in 1997, leading to the current situation where there are very few air force operational command positions above the tactical level.

This lack of higher level operational command experience has been exacerbated by a lack of appropriate senior air force officer PME. At the moment, most senior Air Force officers' PME ends at the DP 3 level with completion of the CSC, as few Air Force officers from operational military occupations have attended DP 4 level courses at CFC. However, very little of the Command and Staff Course, or the Advanced Military Studies Course and the National Security Studies Course for that matter, is dedicated to examining Air Force history, leadership and C² issues in a comprehensive way at the graduate level. This puts Canadian air force senior leaders at a disadvantage compared to their US Air Force counterparts, almost all of whom have completed DP 4 equivalent courses focussing on the employment of aerospace power given by the US Air Force Air War College. This lack of appropriate senior officer PME has had an effect on many aspects of the Canadian Air Force.

Arguably, the lack of appropriate PME has had its greatest impact on Canadian Air Force doctrine, or rather the lack of such doctrine. As noted above, the lack of coherent Air Force doctrine related to command and control above the tactical level has led to the piecemeal development of dysfunctional C² arrangements that continue to cause problems for the Canadian Air Force to this day. As an aside, it must seem strange indeed to the CDS and other senior Army officers leading current transformation initiatives, who view doctrine as a central part of their culture and as the foundation for much of what they do, to be dealing with an organization, the Air Force, that has no doctrine above the tactical level.

Linked to the issue of air force PME and doctrine is the air force culture that, as Builder noted, is based on technology rather than people, where aircraft or systems have become the focus and are often ends in themselves. This has led to a situation where the Air Force has not made the same intellectual contributions to the development of CF leadership and command concepts as the other environments, particularly the Army. For example, only

recently has the Air Force committed to research in the human dimension of leadership and command. This commitment comes at an auspicious time as there are indications that post-9/11 operations are generating data on human behaviour in war that are starting to change some long held ideas about these concepts.

The lack of air force senior command experience, appropriate PME, and doctrine has led to the Army view dominating most operational-level CF doctrine and CF doctrine related to leadership and command. Air force contributions are needed, because the current security environment, involving command and control of *ad hoc* “coalitions of the willing” and leadership of small, culturally diverse teams of experts, requires new ways of thinking about C² that may come from air force experience. Furthermore, the Canadian Air Force must develop a command and control culture that is adaptable and flexible if it is to successfully undertake expeditionary operations in the new security environment. In order to create such a culture, however, the Air Force must have a sound intellectual foundation for this culture, based on research, experience (especially command experience) and PME.

The most visible manifestation of Air Force C² problems are the current Air Force C² arrangements. The arrangements consist of organizations (i.e., Air Command, the Air Staff, 1 Cdn Air Div and different types of wings) with no clear chain of command, overlapping authority and responsibilities, and limited usefulness in expeditionary operations. Recent CF transformation initiatives may remedy some of these problems, but it is too early to tell if the initiatives will resolve the problems or add complications onto an already over-complicated organization of CF air resources.

The impact of these dysfunctional Air Force C² arrangements has been particularly evident in Air Force support operations in an expeditionary environment. But attempts to address the problems with expeditionary Air Force support operations, such as the AFSC, have been hampered by a lack of doctrine and policy guidance.

Many recent initiatives to improve CF and Air Force C² arrangements have been based on concepts like NEOPs, NCW, information age warfare, the OODA loop, and EBO. As we have seen, these concepts are themselves evolving, they are not always well articulated or described, and are not supported by rigorous research. Moreover, while these concepts may contain some useful ideas, they also contain inconsistencies and conflicting approaches to C². For example, from an air force perspective, current networked operations theories, like NCW, emphasize concepts like self-synchronization and mission command (or command-by-influence) that are problematic in air force operations. In the foreseeable future, as we have seen, air forces will continue to rely on command-by-plan, and, in certain cases, command-by-direction. Therefore, the CF's, and the Air Force's, practice of borrowing doctrinal and theoretical concepts from the US without examining them thoroughly in a Canadian context is risky and could lead to unwanted consequences. This is true of doctrinal concepts like “centralized command and decentralized execution,” but it is particularly true of the notion of effects-based operations, which has been adopted by many in the Canadian Air Force as a guiding principle. However, EBO is still poorly understood and subject to different interpretations, and the Canadian approach to this notion is handicapped by a lack of research, doctrine (including lessons learned), debate and adequate PME.

Now that key issues in air force command and leadership have been summarized, this chapter will conclude with a discussion of the future of Canadian Air Force command and control by identifying key problems and by suggesting ways to address these problems.

The Future of Canadian Air Force Command and Control

The Problems. The causes of current problems in Air Force C² are numerous and varied. These causes can be categorized under headings like historical experience, professional development, PME, and doctrine, but they are inextricably interwoven.

At the root of the problems is historical experience. Recent history has shown that some problems with Air Force command are directly attributable to CF problems in developing C² arrangements. The ad hoc manner in which CF arrangements have been allowed to evolve, and the propensity of some in the CF to embrace the latest fads in C² without regard to their usefulness, has created an environment where developing effective CF C² arrangements is problematic at best. However, the fact that the Air Force culture did not include much in the way of higher operational command experiences nor comprehensive C² doctrine above the tactical level made a bad situation even worse.

For most of its history Canada's Air Force, for various reasons, has not provided adequate command experience above the tactical level for its senior officers. Since the disbandment of the air groups in 1997, the primary reasons that the Canadian Air Force has been unable to provide adequate higher level operational command experiences are that: (1) there are very few operational-level Air Force command positions from major to brigadier-general; (2) there are no command positions at the brigadier-general rank within the Air Force; (3) command of 1 Cdn Air Div gives limited command experience because it is more of a force generator than a force employer; (4) there is no preferred career path for air operations officers; (5) there are limited training opportunities across all rank levels at the operational level of war; and (6) the Air Force does not routinely conduct exercises to develop the necessary abilities for the operational level of war. In order to succeed at the operational level of command, CF Air Force officers must hone their intellectual competency and decision-making skills related to their primary tasks of planning, executing and coordinating joint theatre-level campaigns. Furthermore, as officers advance in their military career, the requirement to respond to unpredictable situations demands extensive analytical skills. For the general officer, these skill sets are primarily developed through a combination of exposure to a wide range of experiences and professional education.¹⁶⁷ However, as we have seen, there are limited professional development opportunities to adequately prepare senior air force officers for higher command and significant problems with Air Force senior officer PME.

The result of this situation has been the creation of a culture in which many senior Canadian air force leaders have often found it difficult to rise above their tactical experience (leading people) and to exercise those command functions that are necessary at the operational and strategic levels of command, and especially those functions related to leading the institution.¹⁶⁸

As worrying as these problems related to institutional leadership should be, recent studies finding perceptions of "a profound lack of effective leadership" at the tactical level (leading people) in some parts of the Air Force should be alarming. This is a level where, historically, Canadian air force leaders have demonstrated a great deal of competence, and it should be

167 These issues are discussed in more detail in G.E. (Joe) Sharpe, "C2 Evolution from an Air Force Perspective" in Douglas L. Erlandson and Allan English, eds., *Air Force Command and Control* (Toronto: Canadian Forces College, 2002), 9-22; Harry Kowal, et al., "Air Force Operational Commanders of the Future: The Human Dimension" in Erlandson and English, eds., *Air Force Command and Control*, 23-36; and Anne Loesch, et al., "The Development of Air Force Operational Commanders," in Erlandson and English, eds., *Air Force Command and Control*, 37-51.

168 These types of leadership are described in *Conceptual Foundations*, 12, 48-9.

particularly worrisome that some of the causes of these deficiencies have been identified but apparently not acted upon.¹⁶⁹

Now that some of the problems with Canadian Air Force command and control have been articulated, it is time to see how they might be addressed.

Addressing the Problems. The historical problem of very limited opportunities for air force leaders to experience command at the operational level was recognized in the Chief of the Defence Staff's *Annual Report 2001-2002*,¹⁷⁰ but none of the solutions to the problem given in the Report has yet had any noticeable impact on resolving the problem. Given the size of the Canadian Air Force and its current philosophy of force employment, this may be an intractable problem, but it may be prudent for the Air Force to examine the Canadian Navy's and the Canadian Army's approaches to this issue. For example, the Navy has just assumed command of Standing NATO Maritime Group 1 and the Army has secured an agreement for selected general officers to be appointed Deputy Commanding General of a US Army Corps.

With its command-centric philosophy, the new CF transformation initiative appears to address a number of the problems with CF C² described earlier. However, while it is still too early to tell, the new CF transformation does not appear to address the issue of very limited opportunities for air force leaders to command at the operational level as, for now, the various one and two star Joint Task Force positions appear to be tied to regional positions held by Army and Navy officers. Nonetheless, as the new CF C² arrangements evolve, the Air Force will need clear doctrinal statements of Air Force C² principles to avoid misconceptions in some parts of the CF about how Canadian aerospace power should be used.

The longstanding problem of a lack of Air Force doctrine and lessons learned should be resolved in the not too distant future, as the CF Aerospace Warfare Centre has been assigned the resources and the responsibility to address this problem. However, the dissemination of this knowledge through the CF and Air Force PME systems remains problematic. For example, every CF school now creates its own curriculum with very little co-ordination among schools. The examples given in Chapter 5 where CFC arbitrarily modified the CSC curriculum by replacing Canadian aerospace doctrine with US aerospace doctrine and by removing many of the theoretical foundations necessary to fully understand mechanical planning processes are but two examples of the fragmented state of CF and Air Force PME. Until the CF and the Air Force establish an integrated training and education system with a coherent command and leadership curriculum, this problem is likely to remain unresolved. The other major PME problem for the Air Force is to ensure that senior officer PME is appropriate and given to the right people at the right time.

Until very recently air force, especially Canadian Air Force research focussed on technology and neglected the human dimension of command. This has led to technology, not human requirements and doctrine, driving change in Western air forces. As US Air Force historian Richard Hallion put it: "Doctrine traditionally has been an area in which the air forces of the world have been most weak. Too often air forces allow the state of technological research and development to push them down acquisition paths that may or may not be appropriate."¹⁷¹

169 See, for example, Allan English, "Survey of Current Leader Development in the Air Force" for Defence Research and Development Canada, 17 March 2004.

170 Chief of the Defence Staff, *Annual Report 2001-2002*, www.cds.forces.gc.ca/pubs/anrpt2002/air_e.asp. Accessed 29 Nov 2006.

171 Richard P. Hallion, *Strike from the Sky* (Washington, DC: Smithsonian Institution Press, 1989), 3. See also Carl H. Builder, *The Icarus Syndrome: The Role of Air Power Theory in the Evolution and Fate of the US Air Force* (London: Transaction Publishers, 1994), 34-7.

The Air Force has begun to invest in research related to the human dimension of command. This bodes well for the future, and this book aims to make a contribution to this research. Some may argue that this book provides nothing new or only “common sense” insights into Canadian Air Force C². Yet, even if this argument is true to some extent, this is the first time that these issues have been covered comprehensively in a Canadian context. And, as we have seen, there are significant national and historical differences that affect how air forces design their command arrangements. Furthermore, even if these insights are based on “common sense,” they have not been extensively used in the command and leadership of Canadian air forces, particularly in the past three decades. Therefore, they are presented here in the hope that these insights may be used more frequently in the future

Chapter 7

Air Force Communities: Stovepipes and Subcultures

Part 1 – Introduction

The study of Canadian Air Force leadership and command is complicated by the variety of communities that make up the Air Force and the subcultures that exist within those communities. While air forces, since their earliest days, have always consisted of an amalgam of groups with their distinct subcultures, little has been written about this facet of air forces.¹ As they became larger and more complex during the First World War, besides the aircrew occupations of pilot and observer and the support occupations of aircraft mechanic, administration, motor transport, and stores, air forces created many new occupations, such as armaments, photography and wireless operators and technicians, to meet the technological demands of war in the air, as we saw in Chapter 5. In the Second World War, with the RCAF expanding to over 200,000 personnel, this large organization required even more occupations, such as the aircrew occupations of air navigator, wireless operator (air gunner) and radio observer, along with new support occupations, such as accountant officers, dieticians, educational officers, provost and security personnel, fire fighters, physical training instructors, and personnel selection officers, to meet further technological demands as well as human resource challenges.² These occupations formed the basis for many of the military occupations that existed in the post-Second World War RCAF and that now exist in today's Air Force.

Given the lack of scholarly attention to the nature and evolution of these occupations and the effect that the interaction among their cultures has had, and continues to have, on air forces, this chapter has been written to partially address this gap in the literature by examining the communities that comprise today's Air Force, with a focus on specific aspects of these communities that have a direct effect on Canadian Air Force leadership and command.

Problems in air force leadership and command have been attributed to the “stovepipes” in which many air force personnel find themselves for much of their careers. These stovepipes are caused by the distinct roles, missions, equipment and operating environment of each air force community and these factors give each community a unique culture. However, the perspective of what constitutes a stovepipe varies according to one's point of view. As shown in Figure 7.1, it could refer to military occupation, i.e., a person might remain in a pilot or a maintenance job throughout their military career, and, therefore acquire a narrow perspective of the Air Force by working in just one type of job. As shown in Figure 7.2, a stovepipe could also refer to working in one community throughout a career, i.e., a person might stay in a search and rescue or a fighter community and not be exposed to other communities' roles and challenges. Note that people in a specific occupational stovepipe will also normally be part of an operational community and sub-community at certain times during their careers. These figures are presented for illustrative purposes only, as a much more complex matrix could be constructed to represent other community and

1 One of the few works directly addressing this subject is John James, *The Paladins: A Social History of the RAF up to the Outbreak of World War II* (London: Macdonald, 1990).

2 DND, “RCAF Personnel History 1939-1945,” unpublished narrative, [1945], Directorate of History 74/7, Vol. I, 253, Vol. II, 458-62.

sub-community relationships. This added complexity is caused by a number of factors, one of which is that how any person self-identifies in terms of community or sub-community will usually be dependent on the length of time that person spends in a particular community. For example, a pilot who has spent their whole flying career in the air mobility community might be expected to identify strongly with that community and the Air Force. And yet a CELE officer who wears a light blue uniform and has supported many different operational communities during their career might identify most strongly with the CELE Branch and less strongly with the Air Force in general, but with no particular operational community. However, a logistician who wears a light blue uniform and who has served most of their career supporting the tactical aviation community might identify strongly with that operational community and might even identify more strongly with the Army than the Air Force. The combination of factors affecting community identification make the categorization, description and analysis of various stovepipes and communities in the Air Force difficult; however, using the concept of culture is one approach to analyzing issues related to differences among communities that impact upon Canadian Air Force leadership and command.

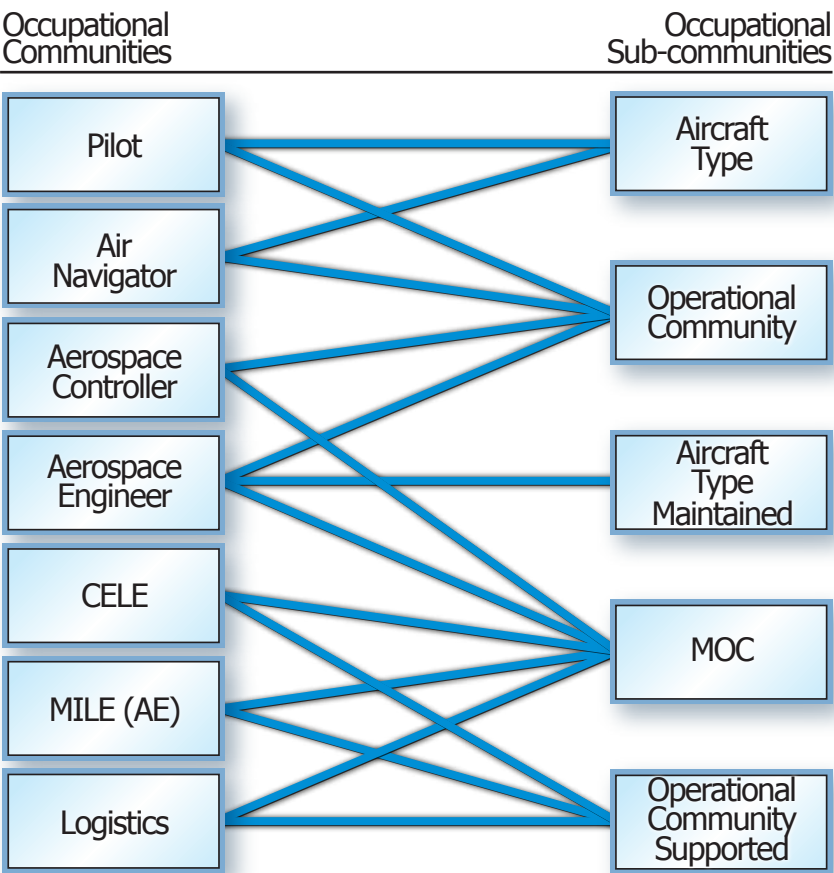


FIGURE 7.1. EXAMPLES OF AIR FORCE STOVEPIPES BY OCCUPATIONAL COMMUNITY

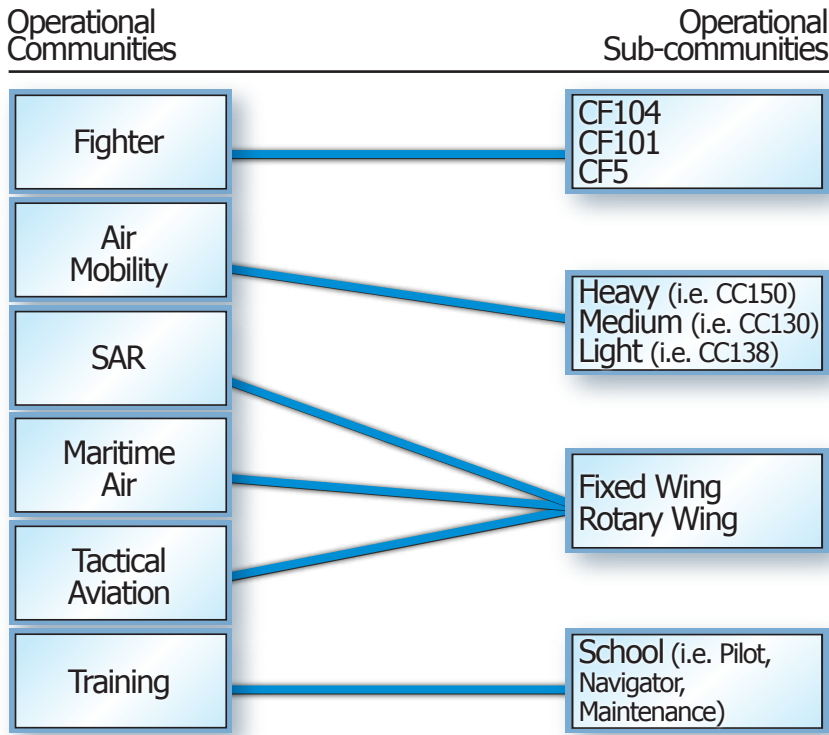


FIGURE 7.2. EXAMPLES OF AIR FORCE STOVEPIPES BY OPERATIONAL COMMUNITY

Culture, described as the “bedrock of military effectiveness,”³ is a powerful analytical concept because it helps to explain the “motivations, aspirations, norms and rules of conduct,” what might be called the essence, of any community’s approach to its mission. The concept of culture also allows us to understand how new technologies may influence and in turn be influenced by military culture in the future. This is a crucial issue because we know that how armed forces fight may be “more a function of their culture than their doctrine,” or their technology for that matter.⁴ Each Air Force community has its own culture and this has a profound influence on leader development and effectiveness and how communities interact with each other. For example, since 1975, and until fairly recently, the most senior Canadian Air Force officer, i.e., the Commander of Air Command or the Chief of the Air Staff, was usually a fighter pilot. The career experiences and cultural predispositions of these leaders of the Air Force had a significant impact on how Canadian Air Force culture evolved over the past 30 years, according to theorists of organizational culture.

Leadership is an integral part of organizational culture, because cultures begin with leaders who impose their values and assumptions on a group, according to Schein. Once a culture takes root, it will define for future generations of members what kinds of leadership are acceptable in that organization. While Schein acknowledges that culture is just a part of a complex group of learning processes, only partially influenced by leader behaviour, he claims that culture creation, evolution and management ultimately define

3 Walter F. Ulmer, Jr. et al., *American Military Culture in the Twenty-First Century* (Washington, DC: CSIS Press, 2000), xv.

4 Paul Johnston, “Doctrine is not Enough: The Effect of Doctrine on the Behavior of Armies,” *Parameters* 30, no. 3 (Autumn 2000), 30.

leadership, and that one of the most decisive functions of leadership is the creation, management, and sometimes the destruction of culture.⁵ But this is just one way of looking at organizational culture.

One of the problems of using culture as a way to clarify concepts about leadership is that those studying culture “do not agree about what culture is or why it should be studied.” This has led to a diversity of approaches that Donna Winslow has categorized into three basic ways of looking at any culture. Her analysis has a great deal of utility when studying air force leadership, as we shall see. Winslow argues that culture can be seen in three fundamental ways: integration, differentiation, and fragmentation.⁶

The integration approach, which is the most common in the military culture literature, portrays organizations, like air forces, as having a single culture that can be defined and with identifiable values and norms that are generally shared by all members of the organization. Organizations are assumed to be integrated wholes, normally stable and operating based on consensus, according to this approach. It also assumes that change is a linear process and that the changed vision or new end state is fixed and can be collectively shared. In this approach, leaders create strong cultures by shaping norms, instilling beliefs, inculcating values and generating emotions. Issues like diversity, differences and dissent are often treated as problems to be ironed out rather than as issues to be explored or possible catalysts for change. In this model, the Canadian Air Force might be characterized as all members of the CF who wear light blue uniforms and who subscribe to the Air Force’s vision and core values.⁷ In the integration approach, culture is viewed as just another lever that leaders can pull to institute change or to improve performance. Leaders who subscribe to this approach implement cultural change in a top down manner, for example, by changing the Air Force vision statement or by instituting “transformational” changes in organizational structure or roles.

The differentiation approach depicts organizations as composed of many different groups, each with its own sub-culture. Using this model, the Canadian Air Force could be seen as a collection of subcultures based on the values and norms of each operational community, e.g., fighter, tactical aviation, maritime, air mobility, search and rescue, etc. In this approach cultural change can result from a struggle among groups as different groups try to place their representatives in strategic positions. For example, the fighter community might try to put its members in key acquisition positions to ensure that a new fighter aircraft is procured to replace the CF18. In the differentiation approach, members of the organization do not act as passive recipients of cultural change; they react, resist and reinterpret changes. In the example just given, in an era of limited resources the maritime helicopter community might oppose moves by the fighter community to put its members in key acquisition positions, claiming that a new maritime helicopter is a higher priority than a new fighter. Most differentiation studies offer snapshots of subcultures at a particular time, and they rarely discuss change. However, when considering change using this approach the presence of multiple cultures in an organization means that strategies for planned change may have to consider simultaneous, multiple and interdependent changes within and between culturally heterogeneous groups. The fundamental principle here is that change in an organization is negotiated, not directed from above.

5 Allan English, *Understanding Military Culture: A Canadian Perspective*. Montreal & Kingston: McGill Queen’s Univ. Press, 2004, 17-18.

6 The concepts in the section that follows are based on Donna Winslow, “Canadian Society and its Army,” *Canadian Military Journal* 4, no. 4 (winter 2003-04), 11-24.

7 The core values are “Professionalism, Excellence and Teamwork.” DND, “Canada’s Air Force, Today’s Air Force, Mission and Roles,” www.airforce.forces.gc.ca/today1_e.asp. Accessed 13 Sep 2006.

The fragmentation approach describes organizations in terms of a loose structure of a variety of groups whose membership overlaps and whose members may coalesce in different ways with different interests, depending on the issue at hand. In this model the Canadian Air Force could be seen as a collection of overlapping subcultures. For example the Air Force could be seen as being composed of the operational communities described above, but within each community there exist different occupational communities (e.g., pilot, navigator, maintenance, logistics, medical, communications). Furthermore, the existence of different aircraft types, different squadrons, different genders, different age groups, and so on within the Air Force further complicates the potential for diverse groupings. And groupings shift according to the issue. For example, the pilot occupation may unite to agree that the next Chief of the Air Staff should be a pilot, instead of some other occupation, but then fall into quarrelling based on what community the CAS should come from, e.g., fighter versus transport. Likewise, if an aircraft type is slated to be taken out of service, then all those who fly, maintain, and support it might coalesce into a group to lobby for its retention in service. Similarly, if new benefits are proposed for members with over 25 years of military service, then older members of the Air Force, irrespective of other affiliations, may band together to support this new policy, while younger members might oppose or resent it.

The fragmentation approach assumes that organizational culture is in a constant state of flux and unstable; therefore, analysis seldom offers clear and comforting prescriptions for action concerning culture change. Furthermore because ambiguity is the operating principle in organizations in this approach, leaders who try to implement change may get unintended results due to complicated, tangled interactions in formal organizations. The basic precept of this approach is that things change according to their own logic, not necessarily according to anyone's plans. From the fragmentation perspective, culture is not a thing to be changed but a dynamic system, and change is a form of organizational learning.

In order to understand organizational culture and organizational change, all three perspectives must be considered so that a clearer picture of the organization can emerge and so that a wide range of strategies may be developed to increase the chances of success in undertaking organizational change.

From one perspective the community issues described above are common to many air forces. However, as we have seen in Chapter 3, these issues were complicated in the Canadian Forces by integration and unification processes. Starting with integration in the post-Second World War era and continuing with the unification of the CF in the post-1968 era, organizational and culture change processes were put in place that made Canadian Air Force community cultures unique. Many of the challenges of unification and integration, from a community perspective, were dealt with in an informal way, as described in Chapter 4, by the evolution of a number of community/capability-based advisory groups. After the dissolution of the Air Group structure in 1997, an attempt was made to formalize the way in which community issues would be dealt with, by creating eight CAGs: Fighter Capability Advisory Group, Maritime Air Advisory Group, Air Mobility Advisory Group, Tactical Aviation Advisory Group, Aerospace Control Advisory Group, Training Advisory Group, Air Reserve Advisory Group, and Support Capability Advisory Group. As noted in Chapter 4, the mandate of the CAGs is to provide a recognized mechanism for community/capability-based leadership consultation and decision-making, and to enhance the promulgation of direction in support of the Commander 1 Cdn Air Div. The CAGs have three main areas of interest: personnel, capability issues and directed issues, and they supplement and complement existing staffing and associated processes by enabling focussed discussion and decision making by subject matter experts in each of the capability areas.

From a community culture point of view, the CAGs represent a mix of operational and occupational communities, and what might be described as an employment-based community—the Air Reserve Advisory Group. The nature of the CAGs is another example of the complexity of the categorization, description and analysis of Air Force communities, and of how the differentiation and fragmentation approaches to culture apply to the case of Air Force culture. For example, a Reservist logistician assigned to support a tactical aviation squadron could be affected by decisions made by three CAGs (Tactical Aviation, Air Reserve, and Support Capability) and could self-identify with one or all of those communities to some degree. That same person could also self-identify in a number of other ways, e.g., by occupation, as a member of the squadron supported, or as a Reservist. As a first step in addressing issues of community identification, it is necessary to gather and publish data about individual communities.

Methodology

Given the importance of communities and their cultures to Canadian Air Force leadership and command and the lack of written descriptions, let alone analysis, of their roles in the Air Force, it was decided to capture as much community input, relevant to this study, as possible. Through the Deputy Commander Mission Support and Training at 1 Cdn Air Div and the CF Aerospace Warfare Centre, requests to provide input were made to representatives of the principal Air Force communities. In some cases these were operational communities and in other cases they were occupational communities. Since the Air Reserve community is scattered across other communities, data on the Air Force Reserves was requested from each community. Authors of community descriptions were asked to organize their descriptions along the following themes, which were designed to focus on leadership and command issues related to the communities:

- a. introduction giving the background or history necessary to understand how each community functions;
- b. description of the jobs or roles of each community noting differences in expeditionary, deployed or static environments;
- c. description of the organizational structure(s) used by each community in executing its roles, noting differences in expeditionary, deployed or static environments;
- d. description of the relationship of each community with other communities noting differences in expeditionary, deployed or static environments;
- e. description of the role of Reserves in each community;
- f. factors that affect culture and leadership in each community;
- g. perceptions on who is considered to be in the air force in each community; and
- h. conclusion giving a summary of the main issues and suggestions for areas related to the human dimension of Air Force operations that need research.

Responses were received from most Air Force communities, with the notable exceptions of the intelligence and medical communities. The second part of this chapter presents the community responses organized by theme.

Part 2 – Community Descriptions

The community descriptions that follow were written by subject matter experts in each community, and they are identified, where known, in the notes. These descriptions were reviewed and approved by the appropriate CAG.

Aerospace Maintenance Community⁸

Introduction. The Aerospace Maintenance community is comprised of aerospace engineering (AERE) officers and aircraft maintenance technicians who work together as a team in support of maintenance operations. The AERE officer's primary responsibility is to provide the leadership and the co-ordination of aircraft and aerospace systems maintenance activities to ensure their airworthiness and readiness in support of Air Force operations. AERE officers are required to develop a comprehensive knowledge of air operations, and to gain expertise in a wide spectrum of engineering and maintenance disciplines and associated management activities in such diverse fields as aeronautics, structures, propulsion, mechanics, electrical, electronics, metallurgy, communications, explosives, automatic controls, computers, acoustics, optical and systems analyses.⁹ Aircraft technicians are qualified and authorized to perform aircraft maintenance to the highest level of proficiency in any field of operations. As a result of a major re-organization initiative that took place in the mid-1990s, there are currently four aircraft maintenance occupations: aviation (AVN), avionics (AVS), aircraft structures (ACS) and Non-Destructive Testing (NDT).¹⁰ The amalgamation of 13 trades into these four occupations has resulted in a more flexible construct to support operations, but the transition has brought its own challenges. These challenges include transforming training institutions, maintaining skill levels, and closely monitoring qualifications and authorizations.

Maintenance operations are concerned predominantly with the following matters:

- Airworthiness;
- Safety (Flight Safety, Weapons Safety, Explosives Safety, General Safety);
- Maintenance Quality (AF9000 Plus);
- Maintenance Readiness; and
- Aircraft Readiness.

The five distinct communities recognized as conducting or contributing to maintenance operations are listed below:

- Tactical Aviation
 - 400, 403, 408, 417, 427, 430, 438, 439, 444 Sqns
- Fighters
 - 1 Air Maintenance Squadron (AMS), 3 Escadron de maintenance - Air (EMA), 410, 416, 441, 425 Sqns, 4 SES (Software Engineering Sqn), 10 Field Technical Training Sqn (FTTS)
- Transport
 - 8 AMS, 402, 435, 413, 442, 440, 426 Sqns
- Maritime
 - 12 AMS, 14 AMS, 19 AMS, 423, 443, 407, 404, 405, 406, 415 Sqns, 14 SES, Helicopter Operational Test and Evaluation Facility (HOTEF), Maritime Proving and Evaluation Unit (MPEU)

⁸ The contributors to this community description were LCol Harry Kowal, LCol Simon Sukstorf, Maj Mike Barker, Maj Dave O'Brien, Maj Claude Paul, Maj Mike Ross, and Capt Wes Cunningham.

⁹ Department of National Defence (1999). *Aerospace Engineering Occupational Specification* (DND Publication A-PD-055-002/PP-001). Winnipeg, Manitoba: 1 Canadian Air Division, Canada.

¹⁰ Department of National Defence (2001). *Chief of the Air Staff Occupational Analysis (OA) for MOCs 514, 526 and 565* (DND Publication). Ottawa, Ontario: Chief of the Air Staff, Canada.

- Materiel / HQ Group
 - 1 Cdn Air Div, Aerospace and Telecommunications Engineering Support Sqn (ATESS), NDHQ, Director General Air Equipment Program Management (DGAEPM), including the Aerospace Engineering Test Establishment (AETE), Canadian Forces School of Aerospace Technology and Engineering (CFSATE), and miscellaneous units.

Each community is responsible for establishing its own fleet employment training plan, its own career progression and monitoring system, and to some extent, its own unique maintenance practices.

Community Jobs or Roles – Static Employment – Main Operating Base. In a static environment, maintenance operations include first-line servicing, second-line inspection bays and support shops, aircraft log control, engineering support, quality assurance, and safety. In larger units these responsibilities are typically divided amongst a number of officers and senior NCMs. The static position also demands that the officer and senior NCM be an effective personnel and finance manager. Maintenance operations in an operational squadron are led by an AERE major referred to as the Squadron Aircraft Maintenance Officer (SAMEO) (except in the Reserve Tactical Aviation Sqns where the SAMEO is a captain), supported by junior officers and senior NCMs. In Air Maintenance Squadrons (AMSs), maintenance operations are led by a lieutenant-colonel Commanding Officer (CO), supported by senior and junior officers as well as senior NCMs.

Community Jobs or Roles – Deployed. The main roles of deployed maintenance operations are similar to those in the static environment, with the exception of second-line inspections and support shops. Many of the static functions are combined and are the responsibility of a single maintenance officer or senior NCM during deployed operations. Deployed senior maintenance managers require an in-depth understanding of the mission, the environment, airworthiness and other regulations as well as personnel management. They must also be accountable for their decisions and be able to solve problems with little or no assistance. Depending on the size and scope of the deployment, the maintenance component will typically be led by a junior officer or senior NCM. When deployed, AMS personnel are integrated into the deployed operational squadron organization.

Community Jobs or Roles – Expeditionary. Expeditionary maintenance operations require the senior maintenance manager to be deployed for extended periods of time. The individual must be capable of carrying out all of the functions of a deployed officer. Depending on the size and scope of the task force, the maintenance organization is led by an AERE major or senior captain, supported by either additional junior officers or senior NCMs. All AMS support elements will typically be led by one senior NCM.

However, the nature of maintenance support to deployed operations varies widely according to the needs of the operational community being supported. For example and as shown in Table 7.1, the fighter community has specific distinctions for static, deployed and expeditionary operations. On the other hand, the Maritime Helicopter (MH) community does not typically use the term expeditionary, but it conducts many deployed operations over long periods of time. In preparation for deployment, a Helicopter Air Detachment (HelAirDet) is formed for each ship participating in the task group. The HelAirDet is comprised of both aircrew and maintenance personnel. The complement of personnel varies depending on the class of ship that will embark the helicopter(s).

Capability	Static (Main Operating Base)	Deployed (~3 wks)	Expeditionary (CEFCOM Task Force)
Servicing	Flying squadrons have all aircraft servicing functions. Normally, these are provided by a separate organization (crew) than the snags organization, with routine rotations to ensure personnel training and currency.	The servicing and snags organizations are typically combined. They are still made up of flying squadron personnel.	The servicing and snags organizations are typically separated, like at the MOB. They are still made up of flying squadron personnel. Depending on the size of the task force, there may be a combination of personnel from several flying units.
Snags	Flying squadrons have their own, integral snags capability. This is augmented as required by specialist support from the Air Maintenance Squadron (AMS) such as NDT, imaging.	Aircraft are selected to minimize the requirement for specialist support. Where possible, specialist support is sought out from the hosting base. Only when required are AMS personnel deployed.	Personnel will rotate between servicing and snags on a routine basis to ensure training and provide a variety of work tasks. Specialist support will likely be deployed from the MOC or specialists from the hosting base may be used.
	Limited spares are kept on hand at the unit.	A significant amount of consumables are deployed with the squadron, along with spares of the lowest MTBF [mean time between failures] items, to reduce dependency on supply runs back to the MOB.	Stockpiles of most spares and consumables are maintained at the task force location to account for the extended supply lines.
	Engines are typically only removed and installed by squadron personnel. Engine maintenance is an AMS function.	Depending on the size and length of the deployment, a spare engine is typically brought.	Spare engines are typically brought for installation and removal as a unit.
Periodic	Flying squadrons perform their own periodic inspections.	Periodic inspections are not performed when deployed. Personnel from the periodic inspection organization are often deployed within the servicing/snags organization for training.	A task force will typically not perform full periodic inspections. Contingency Aircraft Maintenance Program inspections, which are abbreviated inspections may be carried out in theatre.

Capability	Static (Main Operating Base)	Deployed (~3 wks)	Expeditionary (CEFCOM Task Force)
Weapons	Flying squadrons perform their own weapons loading and conveying.	Typically only self-defence stores are deployed. Loading and conveying duties remain within the flying squadron.	The servicing organization will perform all required weapons load procedures. Convoy duties will be assigned depending on local requirements.
	The AMS performs all weapons storage build-up and maintenance.	Flying squadrons seldom deploy with an AMS supported weapons capability. Flying squadron personnel are trained before departure to perform routine chaff/flare build-up.	AMS personnel will perform weapons storage, build-up and maintenance functions for the weapons deployed to theatre. Typically, only “upon removal from storage” and functional check-type maintenance will be performed on complex munitions (missiles).
Shops	Flying squadrons have a limited structures repair capability.	Much of the structures repair capability is routinely deployed with the squadron.	Most of the flying squadron structural repair capability is routinely deployed, along with a battle damage repair capability. Work requiring special infrastructure (paint booths, etc.) will typically be done at hosting base facilities by CF personnel.
	The AMS performs many mechanical component overhauls and some avionics repair.	Sufficient spares are deployed to avoid the requirement for shop support.	Limited shop support is deployed. Typical capabilities include battery maintenance, wheel and tire build-up, some avionics repair, armament equipment repair, and a records keeping function.
Engineering Support	Engineering support is provided by DGAEPM and contractor field service representatives. Very little performed in the flying squadron or AMS.	Same engineering support that is provided at MOB.	Long lines of communication and urgent timelines may force decisions to be taken by task force engineering personnel. Decisions made on an urgent basis are communicated back to DGAEPM for confirmation after the fact.

TABLE 7.1. FIGHTER COMMUNITY AEROSPACE MAINTENANCE FUNCTIONS

Organizational Structure – Static Employment – Main Operating Base. In the static environment, the maintenance organization is structured around the main functions of first line and second line, with log control and engineering support grouped together. The quality

management and safety functions are integral to the organization, and usually report directly to the CO. Each maintenance community organizes these functions uniquely. The Maritime Patrol community employs primarily a centralized maintenance concept while the fighter community embraces a squadron maintenance approach. In centralized maintenance, the AMS CO is responsible for all maintenance activities. In squadron maintenance, the SAMEO reports to the CO of the operational squadron, but is also accountable to the Senior Aircraft Maintenance Authority (SAMA). The SAMA is appointed by name and is typically the AMS CO (except in Tactical Aviation where the SAMA is in 1 Wing HQ). This oversight relationship of the SAMA over the SAMEO is established to ensure the optimum support of maintenance operations.

Organizational Structure – Deployed – Expeditionary. The internal structure prevalent in a static maintenance organization is modified for deployed or expeditionary operations. The senior maintenance manager in charge assumes the aggregate roles of first line, second line, engineering support, quality management, safety and normally certain delegated airworthiness authority functions. Communications and chain of command are altered as the deployed officer typically reports to the Detachment Commander. Any links with the home base are often unofficial, and must sometimes be filtered through a coordinating agent. The culture within the maintenance community is to grant a high level of autonomy to maintenance personnel while deployed. For example, the senior supervisor for a HelAirDet, known as the Det Chief, would typically be granted authorities normally associated with a SAMEO at a static location. Similarly, the Task Group AERE officer embarked in the Auxiliary Oiler Replenishment (AOR) vessel would have greater responsibility and authority than their counterparts ashore.

Relationship of the Aerospace Maintenance Community with other Communities. The aerospace maintenance community enjoys a close relationship with the operational (flying) community. This is attributable to the fact that the maintenance community is primarily a service provider for the operational (flying) community. The maintenance community has traditionally aimed to be self-sufficient in this regard, but still requires support from the essential services provided by the logistics community. In addition, the delegation of the maintenance and repair of aircraft maintenance support equipment (AMSE) in recent years to the Electrical and Mechanical Engineering (EME) community has created a closer working relationship with that community, but it could not be characterized as symbiotic. Finally, Tactical Aviation and the MH community share a close relationship with the Army and the Navy respectively by virtue of sharing a common working environment.

Description of the Role of Reserves in the Aerospace Maintenance Community. Reservists have supported the aerospace maintenance community in a number of ways. They have helped fill vacancies that have resulted from many years of cutbacks and staff reductions, typically filling non-deployable support positions such as those in labs, tool control, IT support and out-of-trade employment. Reservists have also been playing an increasingly important role in the training of apprentices, filling many of the newly established positions in Technical Training Flights (TTFs), using their vast amount of experience to teach apprentices and ensure continuity in the training program. Tactical Aviation depends heavily on Reservists for deployed operations as well. Every unit has a significant number of Reserve Force personnel filling their ranks, and two units, 400 Sqn in Borden and 438 Sqn in St-Hubert, are Total Force units, meaning that the majority of their personnel are in the Reserves.

Factors that Affect Culture and Leadership in the Aerospace Maintenance Community.

Culture

Organizational structure has a definite effect on culture and attitudes. Central maintenance is structured as an efficient means of providing maintenance services, supporting separate operational squadrons. Unless a concerted effort is maintained to inform maintenance personnel of their contribution to operations, this organizational structure may lead AMS members to lose focus on the importance of their role and of their impact on operations. When considering an expeditionary or deployed operation, aircraft maintenance is usually integrated with the deployed unit, and the maintenance personnel benefit from a unified understanding of the role and commitment to the mission of the unit. Over time, on expeditionary or deployed operations the perceived disparity between the maintenance and operations focus of each organization dissolves and the force operates as a single entity.

The culture, traditions and even the leadership styles within the Maritime Helicopter and Tactical Aviation communities tend to be heavily influenced by the Navy and the Army respectively. For example, while embarked, HelAirDet personnel are bound by the customs, traditions, and discipline of the Navy just as are the other member of the ship's company. Similarly, the Tactical Aviation element is such an integral part of land operations that its tactics, traditions and to some extent, its doctrine, are heavily shaped by the Army. The Tactical Aviation community, however, perceives cultural and interaction challenges in many areas. First, the geographical dispersion of its units across six different cities leads to autonomy and creates communication challenges. Secondly, the fact that all of its squadrons are self-contained units forces them to be self-sufficient, in order to be able to operate without the support of other organizations for certain periods of time. Lastly, as most 1 Wing squadrons are lodger units on Army bases, they tend to be isolated from the rest of the Air Force.

Leadership

Since they are primarily engineers who must become conversant with and adhere to airworthiness regulations, maintenance leaders tend to be pragmatic and analytical in their approach. They must be familiar with risk assessment techniques and procedures to properly advise their operational commanders in making decisions on the use of aerospace equipment in the conduct of operations. The prevailing culture in the maintenance community is for leaders to study issues systematically to arrive at the best possible outcome.

The human dimension of leadership that stems from personal authority¹¹ has been recognized and embraced by the maintenance community. This is evidenced by traditional activities such as town halls, strategic planning sessions, quality of life initiatives, working groups, and honours and awards ceremonies, which are intended to promote team building, creativity and unit effectiveness. By virtue of the maintenance organization structure, AERE officers and senior NCMs are afforded many opportunities throughout their careers to hone their leadership skills by being placed in charge of subordinates.

A predominant culture in the aerospace maintenance community is the duty of care for the well being of their subordinates that is engrained in all supervisors. This duty of care is also imparted in the central role played by A4 Maintenance within the Air Division.

¹¹ As defined in Ross Pigeau and Carol McCann, "Re-conceptualizing Command and Control," *Canadian Military Journal* 3, no. 1 (Spring 2002), 58-9.

The incumbent of this position is normally appointed the Occupation Advisor for all aircraft maintenance technicians, with the ultimate responsibility to promote training, education, career progression, and the overall health of the Aerospace Maintenance community. A4 Maint is assisted in this role by a nominated “Branch CWO” who is the central representative for all maintenance technicians, and Senior Occupation Advisors. The duty of care is also resonant in the AERE Council, which is the oversight body for AERE officers. The Council meets regularly to discuss AERE issues and sets the tone for the health and evolution of the classification.

Managing the transformation and concerns of the aircraft technician community has spawned many initiatives such as the Air Technician Transformation and the Aircraft Technician Career Development Plan.¹² These initiatives have clearly communicated to the maintenance community that senior leadership is taking steps to address retention, career and welfare issues, and that senior aircraft technicians are recognized as the backbone of the Air Force. In his article, the “Silver Bullet,” Colonel D.B. Millar (former A4 Maintenance) contends that what matters most to technicians is recognition and through the Aircraft Technician Career Development Plan has created a culture that encourages the timely recognition of the contributions of aircraft maintenance technicians to the support of operations.¹³

Training and Education. AERE officers generally require formal education, military-specific training and experience in order to meet the aim of their employment philosophy. The formal education is usually acquired through a university degree in engineering or science and may require additional training in the form of graduate studies for designated positions. The military training occurs in the form of generic practical phase training (PPT) usually taken between academic years when the degree is being pursued. It is rounded out with an in-service basic occupation course once a university degree is obtained. When their basic occupation training is completed, AERE officers are typically posted to the flight line or a staff position in DGAEPM, another engineering organization, or a headquarters.

The AERE Council, which is an element of the Support Capability Advisory Group, has significant influence on the training and professional development of AERE officers. The AERE Council has recently initiated Project Empennage (under the guidance of one of the Council members, Colonel John Madower) to proactively align AERE training with the Airworthiness Policy, Aircraft Maintenance Policy, and the support requirements of an expeditionary Air Force.¹⁴

Who is considered to be in the Air Force in the Aerospace Maintenance Community?

The aerospace maintenance community has always enjoyed a strong sense of belonging to the Air Force with a true sense of pride because aircraft maintenance is integral to operations. Despite their close link to the operational environments they serve, aerospace maintenance officers and technicians employed within the MH and Tactical Aviation communities take great pride in distinguishing themselves from their Navy and Army colleagues and are quick to point out that they are members of the Air Force.

Conclusion and Summary of Main Issues. In summary, while the Maritime Patrol, Fighter, and Transport communities are well suited for deployment or expeditionary operations,

12 Lieutenant-Colonel G. Danylchuck, “Aircraft Technician Transformation Project,” 18 February 2005

13 Colonel D.B. Millar, “Silver Bullet,” accessed 16 February 2006, online at winnipeg.mil.ca/a4maint/sections/a4occrdms/subjects/silver_bullet/silver_bullet.doc

14 Lieutenant-Colonel S. Sukstorf, “Project Empennage,” October 2005.

the term “expeditionary” is not in the vocabulary of all maintenance communities. The maintenance community at large has been able to be responsive and adaptable to the specific needs of the detachment, operation or task force in which it has been employed in the past. Although both static and deployed environments exist, the focus for even the static elements with the Maritime Helicopter and Tactical Aviation communities is on deployments.

The theme of the 2005 AERE Professional Development Seminar¹⁵ was “Aerospace Engineering Officers in an Expeditionary Air Force.” Future research topics that relate to the human dimension of Air Force operations included:

- Joint Operations Command and Control
- Expeditionary Engineering
- Expeditionary Flight Testing
- C4ISR
- Space Operations
- Unmanned Aerial Vehicles
- Support to Operations, etc.

Airfield Engineering Community¹⁶

Introduction. The Airfield Engineering community is part of the Canadian Military Engineering (CME) Branch. CME encompasses a wide diversity of military occupational structures and trade skills that work in concert towards the common goal of providing the best possible military engineering support for the Canadian Forces.

The first post-Second World War Air Force Airfield Engineering Squadron (AES) was formed at CFB Lahr, Germany, in response to the mission requirement and national commitment to form within the North Atlantic Treaty Organization an Airfield Damage Repair (ADR) capability. With the end of the Cold War, the focus of operational activity has shifted from the territorial defence of Western Europe to the projection and sustainment of air expeditionary forces, based in and generated from Canada in support of a number of contingency operations and deployed operating bases (DOBs) around the globe.

With this shift in operational focus, as part of current CF Transformation initiatives, Airfield Engineers are changing and developing their Air Force support capabilities in order to ensure mission success both at home and when deployed. The Airfield Engineering Squadrons of today are in keeping with the mission and role stated within the new Air Force Support Capability Concept of Operations and Statement of Requirements (SOR). However, AFSC is more evolutionary than revolutionary with respect to how AE supports Air Force operations. Much of the current AE organizational structure will remain the same under AFSC with minor changes to force structure and command and control reporting relationships.

Community Jobs or Roles – Static Employment – Main Operating Base. The jobs and role of AE personnel at a Main Operating Base (MOB) are to provide engineering support in the areas of airfield lighting/surfaces, infrastructure and utilities. In addition,

¹⁵ This is a biennial seminar for the AERE Branch; this seminar was held at Cornwall, On 14-16 June 2005. Some of the presentations included: “Transformation for the Future”, “Enemy Air Threat – Anywhere from Anybody”, “Expeditionary Engineering”, “Expeditionary Air Force”, “OP APOLLO” from both the MH and 8 AMS perspectives, and “OP SIRIUS.”

¹⁶ The principal authors of this community description were Capt Frank Locke and LCol Kevin Horgan.

the Firefighter occupation provides both aircraft rescue in support of operations as well as structural firefighting in support of infrastructure. Under AFSC, the wing's Mission Support Units (MSU) will include an AES, which will comprise a number of AE flights. When not deployed, AE personnel within these flights will either be standalone or integrated into the Wing Construction Engineering (WCE) Section under operational control of the Wing Construction Engineering Officer who reports to the Wing Logistics Officer. Operational command of the AES will remain with the MSU CO.

Community Jobs or Roles – Deployed – Expeditionary. From a deployed standpoint, AE's role is to assist friendly forces to live, fly and fight, and to deny similar freedoms to the enemy. When deployed, AE personnel perform similar core jobs related to infrastructure, environment and support to operations as they would at an MOB. However, there are a number of unique tasks, and therefore equipment requirements, which AE personnel perform on deployment. Airfield Engineers provide support to intelligence, operations, logistics and civilian-military cooperation (CIMIC) activities. The AE flights are structured into a number of functional technical elements with expertise in such areas as electrical, plumbing, power generation, water/fuels and environment, refrigeration/mechanical systems, fire fighting, CBRN (chemical, biological, radiological, nuclear), and EOD (Explosive Ordnance Disposal). In a deployed environment Airfield Engineer responsibilities fall within four basic areas as follows:

- a. Maintain Mobility – actions to support the ability of air forces to conduct operations at the DOB at will. These actions include: the tactical beddown of forces, construction and repair of existing facilities, Airfield Damage Repair (ADR), and the removal of hazards associated with enemy weapon systems such as mines, booby traps and unexploded ordnance (UXO);
- b. Counter-Mobility – base denial includes the destruction or denial of vital air base resources so the enemy cannot use them against friendly forces or for its own benefit;
- c. Enhance Survivability – Force Protection Engineering – includes the combination of hardening, dispersal, camouflage, concealment and physical protection of personnel, equipment and material from the effects of sabotage, conventional munitions and nuclear, biological and chemical (NBC) attack. Other miscellaneous tasks are engineer support to decontamination operations and construction support to deception operations; and
- d. Sustainment Engineering – infrastructure construction and maintenance, provision of engineer advice, technical expertise and other engineer support that allows the Air Expeditionary Unit (AEU) Comd to maintain, reconstitute and re-generate their forces. Other roles include the provision of utilities, CIMIC tasks, bulk fuel distribution, Emergency Response Services (ERS) and Fire Protection Services.

There are a number of specialized AE occupations, which provide close engineer support when an AEU deploys. The following is a short summary of these occupational capabilities:

- a. Airfield Engineering – Military Occupation Structure Identification (MOSID) 189. Airfield Engineers plan, develop, and implement military engineering tasks and projects. The Airfield Engineer must manage resources, provide advice and liaise on military engineering matters, as well as both lead and have technical control over the organizations carrying out these activities. They serve in command and staff positions at units, bases, formations and at headquarters.

- b. Construction Engineer Superintendent – MOSID 307. Construction Engineering Superintendents are responsible for overseeing, directing, controlling and managing the maintenance and construction of infrastructure, works and utilities required at MOBs and DOBs.
- c. Construction Technician – MOSID 306. Construction Technicians are responsible for: planning and providing general construction services in survey, masonry, painting and carpentry; maintaining, repairing and inspecting building structures and their components; and performing construction surveys.
- d. Electrical Distribution Technician – MOSID 302. Electricians are responsible for providing the entire high and low voltage power distribution system. This includes planning, installing/removing, maintaining, inspecting and repairing the various exterior and interior electrical distribution systems.
- e. Electrical Generation Systems Technician – MOSID 303. Electrical Generation Systems Technicians are responsible for providing, restoring, installing, operating, repairing and maintaining industrial electrical generating systems, and the associated switching and control systems, as well as prime movers attached to other engineering-specific equipment.
- f. Fire Fighter – Crash Fire Rescue – MOSID 149. Fire Fighters are responsible for the provision of fire protection and fire fighting services. Additional tasks include training of auxiliary and volunteer fire fighters, carrying out fire inspections, providing advanced first aid, and assisting in hazmat spill control. The priorities of ARFF operations are entirely mission focused. The primary task is to ensure that fire losses, which could impede an AEU Comd's ability to launch and recover aircraft, do not occur.
- g. Plumbing and Heating Technician – MOSID 304. Plumbing and Heating Technicians are responsible for installing, operating, maintaining and repairing interior plumbing, heating (gas and oil) and water systems as well as fire suppression systems and sheet metal works.
- h. Refrigeration and Mechanical Technician – MOSID 301. Refrigeration and Mechanical Technicians are responsible for installing, maintaining, repairing and operating Aircraft Arresting Systems, refrigeration and air conditioning systems as well as Environmental Control Units.
- i. Water, Fuels and Environment Technician – MOSID 305. Water Fuels and Environment Technicians are responsible for: providing, distributing, collecting and treating water, wastewater, and fuel; conducting environmental assessments and remediation; providing hazmat response; and planning, installing, removing, maintaining, operating and repairing water and wastewater treatment facilities and fuel systems.
- j. Airfield Engineering – Explosive Ordnance Disposal – MOSID 189. Field Engineers (EOD Specialist) are responsible for the reconnaissance and disposal of military explosive ordnance (EO), unexploded ordnance (UXO), unexploded bombs (UXB) and improvised explosive devices (IED).

Organizational Structure – Deployed – Expeditionary. Under the AFSC there will be MSUs at six locations (3 Wing Bagotville, 4 Wing Cold Lake, 8 Wing Trenton, 14 Wing Greenwood, 17 Wing Winnipeg and 19 Wing Comox). Each MSU will have functional squadrons providing close support capabilities in the areas of AE, CIS, LOG, and HR/FIN. The Airfield Engineering Sqn will be organized as depicted in Figure 7.3, with the exception

of selected wings having only one AE Flt instead of two. The AES capability covers a full range of close engineer support activities to cover CAS Planning Guidance (CPG) scenarios. For contingencies, a task tailored, mission-specific AE Flt will be force generated from the AES and, if necessary, from other Air Force Engineer units, based on the required operational support. In addition, the AES will be augmented as required by elements from an Airfield Systems and Utilities Flight (ASU Flt), an Aircraft Rescue and Fire Fighting Flight and/or Explosive Ordnance Disposal Flight (EOD Flt).

Organizational Structure – Static Employment – Main Operating Base. The organizational structure of the AES will remain the same at the MOB. The only change is regarding employment, where the majority of personnel within the AES will be employed in the Wing Construction Engineering section providing engineering support services under the operational control of the Wing Construction Engineering Officer, while operational command will remain with the MSU Commander, who is ultimately responsible for ensuring that the AES is ready to support any deployed air contingency or other assigned operation.

Relationship of the Airfield Engineering Community with other Communities. Air Force support consists of the personnel and organizations responsible for planning and initiating the deployment, re-deployment and reconstitution of air support forces. It entails programming and executing MOB and in-theatre support activities, and sustaining the forces through reach-back and force generation activities. These activities occur while simultaneously planning, conducting and sustaining domestic support operations and day-to-day general-purpose activities.

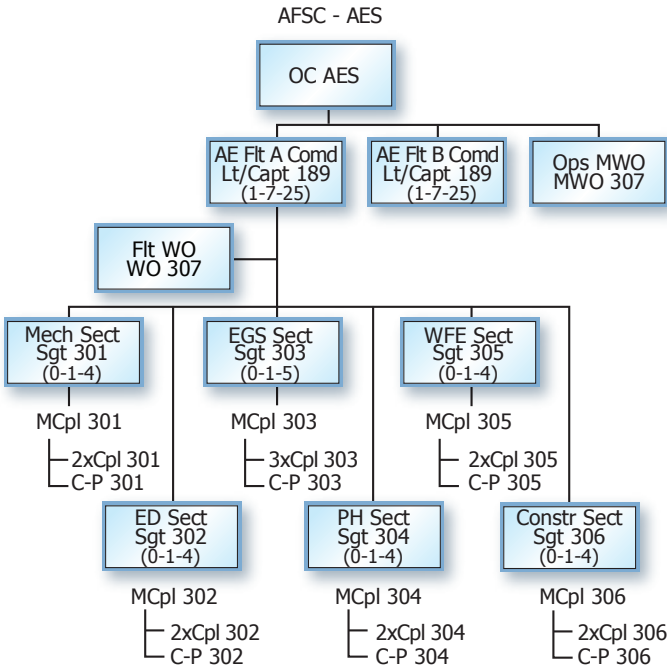


FIGURE 7.3. AIRFIELD ENGINEERING SQN ORGANIZATION UNDER AFSC

AFSC is based on the strategic imperative, to “provide and maintain a relevant force structure that is inter-operable at the component and contingent headquarters level with Canada’s allies, globally deployable and affordable over time.” Within the AFSC construct, close support to air force operations is based in predominantly four communities (Airfield

Engineering, Communications and Information Systems, Logistics and Human Resources and Finance).

The understanding of how each community's role (operational and support) contributes to the success of any Air Force operation is key to mission success. AFSC is based on the premise "train as we fight." For the various close support communities within the Air Force this means structuring support under Mission Support Units and from these units collectively force generating Mission Support Squadrons, which would be task tailored depending on the level of operational support required. The more the various support communities understand and work together on specific Air Force operational missions the more effective that support will become. Static Air Force operations have and will continue to take place but there has to be greater emphasis placed on deployed expeditionary support, which brings the support communities into a cohesive unit that fosters mission focus and a better understanding of each other's role in the projection of air power.

Description of the Role of Reserves in the Airfield Engineering Community. The role and mission of the Airfield Engineer Reserves is the same as their Regular Force counterparts, and AE Reservists primarily augment Regular Force AE Flights on deployment. The AE Reserve program was initiated in January of 1994 to meet the ever increasing demand for operational military engineering support to operations. Its foundation is based on a partnership between the AE Reserve unit and the community in which it is located. The AE Reserves are a heavy Engineer capability. The AE Reserve Flights are comprised of approximately 60 personnel covering 14 military occupations. The AE Reserve Flight structure has a core engineering capability but includes an integral logistics element (i.e., supply, transport, and heavy equipment operators) which give the units greater flexibility and the ability to take on a broader range of tasks. The following Airfield Engineering Reserve Units have been established:

- 14 Airfield Engineering Squadron Headquarters, Lunenburg County, N.S.
- 91 Airfield Engineering Flight (AEF) Gander, Nfld.
- 143 AEF Lunenburg County N.S.
- 144 AEF Pictou, N.S.
- 192 AEF Abbotsford, B.C.

Factors that Affect Culture and Leadership in the Airfield Engineering Community. Within the Air Force community, Airfield Engineers are known for their strong leadership capabilities: this is partly due to the fact that AE personnel serve in all three environments and fill prominent support positions at both the operational and strategic levels of the CF. This provides Airfield Engineers with a greater breadth of leadership opportunities than some other Air Force communities and these opportunities help to develop leadership abilities. Within the broader Air Force community, Airfield Engineers have been provided opportunities to fill key leadership roles in support of air operations both deployed and at MOBs, thus enhancing the depth of their leadership capabilities. Strong AE leadership has flourished under the opportunities to command, but as the experience level of both the AE officer and NCM cadre diminishes, it will be a challenge to maintain the strong leadership presence the community now possesses. Current AE leaders are keenly aware of this situation and are taking steps through a stronger career development program which targets key AE personnel early in their careers who possess the requisite leadership potential to fill potential command requirements.

Who is considered to be in the Air Force in the Airfield Engineering Community?

The Engineer occupations covering MOSIDs 301-307 serve in all three environmental commands (ECs). Employment by position is 55 percent Air Force, 40 percent Army and 5 percent serving with the Navy and other special CF units (e.g., 1 Engineering Support Unit). Fire Fighter (MOSID 149) is a “hard” Air Force occupation and Fire Fighters serve predominantly within the Air Force environment (49 percent of the occupation serves with the Air Force, 39 percent serve with the Navy and the remaining 12 percent serve in headquarters and special units). The officer occupation, Airfield Engineer (MOSID 189), is a “hard” Air Force occupation and its members serve predominantly within the Air Force environment at the tactical and operational levels, while filling selected positions with their Army Engineer counterparts within selected strategic and joint-level organizations. This career path is essential, as a sound understanding of combined/joint operations and doctrine is integral to the career development for all Engineering officers and is intrinsic to the role and influence of the CME Branch. The Field Engineer (MOSID 181) is a “hard” Army occupation, managed by the Army with only one small detachment serving within the Air Force environment. As for Distinctive Environmental Uniform (DEU) assignment, the Air Field Engineer and Fire Fighter occupations are air. The remaining engineering occupations are split approximately 60 percent Air Force and 40 percent Army. All Field Engineers wear the Army DEU. The Air Force is the CF Management Authority (MA) for all these engineering occupations, with the exception of the Field Engineer. This is based on the fact that the Air Force employs the majority of these occupations, but more importantly the Air Force requires the broader and greater technical skill sets these occupations possess.

Conclusion and Summary of Main Issues. The number of established AE positions with the Air Force community is not at a level to meet all current or future Air Force operational requirements. Even under AFSC there will have to be a significant injection of AE positions to meet the planning assumptions noted in the AFSC SOR. The plan on how to create the needed positions is outlined within the AFSC Master Implementation Plan (MIP). Over the short term, some additional AE positions will be created but not to the level required. In addition, the AFSC MIP provides guidance on how the Air Force can better structure its support resources to provide more effective close support while at the same time providing some relief to personnel stretched by an ever increasing operational tempo, which is having a negative impact on the very personnel it requires to ensure mission success.

With personnel pressures in the areas of retention and recruitment, and an accelerating promotion rate, the future holds many leadership and technical-related developmental challenges for the AE community. This has not gone unnoticed and the AE community is working hard to address these challenges. Current AE leadership is looking to existing occupational transfer programs to bring selected Engineer NCMs into the AE Officer core to provide the technical and leadership skills needed to bridge the short-term gap that will exist as young officers develop these essential skills. As well, entry-level occupational qualifications for AE officers are being reviewed with an eye towards making it easier for a broader range of personnel to enter the occupation. The AE NCM occupations are facing these same challenges and by embarking on a robust succession planning process to identify personnel with the requisite potential and leadership skills, the AE community will develop stronger leaders at an earlier stage in their careers to meet the ever demanding and increasing operational tempo.

The CF is deploying to a greater number of high threat environments where Force Protection (FP) is a key concern. FP encompasses a large range of responsibilities (i.e., CBRN, Force

Protection Engineering, Active/Passive Defence) involving personnel from a number of communities, but none are more involved than Airfield Engineers, who hold direct or indirect responsibility in many areas of FP. The AE community is fully engaged with all communities (operational and support) to ensure Engineering support elements are fully understood under the FP umbrella.

The occupational structure of the AE occupations is currently under review through the Military Occupational Structure Analysis, Redesign and Tailoring (MOSART) process. This will indeed provide a key opportunity to structure AE occupations to meet the changing operational demands placed on AE personnel as they deploy to more complex theatres of operations.

Air Force Communication and Information Services¹⁷

Introduction. The Air Force Communications and Information Services (CIS) community is part of the CF Communications and Electronics (C&E) Branch. The C&E Branch Advisory Committee,¹⁸ on which the CAS normally provides an Air Advisor, influences the role of CIS within the larger C&E community. The predecessor of the C&E Branch was born in Oct 1903¹⁹ and was initially of army descent; it was referred to as the Canadian Signalling Corps. Air Force Signals, namely the RCAF Signals Branch, was born in July 1935. It is interesting to note that at that time, the RCAF Signallers served both aircraft and ground communications requirements; today on-board aircraft communication requirements are handled by the Aircraft Maintenance community.

Moving ahead to the near-term, the end of the Cold War shifted the Air Force's focus from the in-place defence of Western Europe and North America to the projection and sustainment of air expeditionary forces, based in and generated from Canada. The Air Force Support Capability initiative is transforming Air Force support from a primarily static stance to an expeditionary one. The Air Expeditionary Unit (AEU) is the force structure through which the Air Force will generate and deploy air power packages including all required integral and close support elements. With this shift in stance and focus, the Air Force CIS community is positioning its capabilities to ensure mission success both in the domestic theatre and while deployed abroad.

Community Jobs or Roles – General. The CIS role, whether deployed or at home in garrison, is identical—providing information services to permit the command and control of assigned forces. The systems provided and supported differ somewhat from wing to wing and from mission to mission, and this is reflected in the elements of the CIS organization. The scale and scope of services offered on deployments are reduced from that provided at the wing, since the Wing Telecommunications and Information Services Officer (WTISO) supports a large number of clients in garrison and a complete Instrument Flight Rules (IFR) airfield in most cases. The deployed IFR airfield is provided by a purpose-built limited capability unit, 8 Air Communication and Control Squadron (8 ACCS) in Trenton. There are, however, a number of tasks that CIS personnel perform uniquely on deployment. The extension and management of bandwidth via thin-line SATCOM terminals is one example.

¹⁷ The main contributors to this section were Maj Paul MacKenzie, Capt Wayne Webb, Capt Luc Gaboury, and CWO Claude Morin.

¹⁸ Information about this committee can be found at the following website address commelec.mil.ca/organization/steering/committee/index_e.asp. Accessed 29 Nov 2006.

¹⁹ A timeline chart showing the Branch evolution can be found at website address commelec.mil.ca/organization/history/branch/images/evolution.gif. Accessed 29 Nov 2006.

The Air Force CIS occupational group is small, consisting principally of Aerospace Telecommunications and Information Systems Technicians (ATIS Tech) and Communications and Electronics Engineering (Air) – Operations—CELE (Air)—officers. Small numbers of Army Signals Operators and Lineman are also part of the grouping. In total, the Air Force establishment for this occupational group is approximately 670.²⁰

Community Jobs or Roles – Static Employment – Main Operating Base. The Wing Telecommunications and Information Services (WTIS) organization responsibilities vary by wing due to the manner in which change has occurred over the last 10–12 years. The wings have gone through a multitude of changes wherein the wing commander has been given the authority to determine how change would be accommodated at their individual wing. This has resulted in unique solutions to such puzzles as: the devolution of TIS responsibilities and authorities; local decisions regarding the implementation of imposed wing establishment reductions in the late 1990s; differing perspectives and emphasis on deployed capability; and the explosion of general purpose information technology and Command and Control Information Systems (C2IS). Regardless, the WTIS organization has the responsibilities noted within 1 Cdn Air Div Order 4–005. These responsibility areas can be categorized as follows:

- a. Telecommunications Maintenance. This responsibility area is associated with the provision of first and second line repair to a myriad of systems that include cable plant, airfield ground radio networks, air-ground-air (A/G/A) radios, plus navigational and landing aids.
- b. Telecommunication Services/Projects. This area relates to the provision of general telecommunication services to the wing end-user, such as the telecommunications help desk, telephone and base switchboard, message centre, TIS requirements/project coordination, and information systems security.
- c. Network Support/Operations. This area concerns first and second line support, operation and administration of the unclassified, designated and classified computer networks and associated peripherals at the wing. Other functions may include web management and minor application development.

In addition to these responsibility areas, the following responsibilities, which are within the competence of the WTIS organization, may be assigned:

- a. Wing Communication/Information Technology Security (COMSEC/ITSEC) advisor and custodian to the WComd and wing on all aspects of Communications and IT Security; and
- b. Wing Chief Information Officer (WCIO) or advisor for management of Wing Management Information Systems.

Community Jobs or Roles – Deployed – Expeditionary. When deployed as a flight, the Communications and Information Systems Flt is the Mission Support Squadron sub-unit that holds the technically qualified tradesmen and equipment employed to provide support to all secure and non-secure CIS for the Air Expeditionary Unit at a deployment base. The CIS Flt Comd also acts as the deployment's Information Security Staff Officer and COMSEC Officer.

²⁰ This number is generally accepted to be below the establishment required. The 1 Cdn Air Div / CANR HQ Centre for Ops Research and Analysis (CORA) has a project to review the health of the CELE Air MOC (similar to the project conducted to review the Pilot MOC several years ago).

As indicated previously, the CIS Flt tasks are similar to those at the MOB/garrison; however, they are scaled and not all tasks are within the flight’s scope. Additionally, the CIS Flt performs tasks with some deployment-unique equipment and provides some capabilities not required in garrison, as noted above.

Organizational Structure – Static Employment – Main Operating Base. The WTISO, like most support elements at the wing, reports to the Wing Logistics Officer. The WTIS organizations have been altered from the organization indicated in 1 Cdn Air Div Order 4-005 because the structure presented within this Order did not clearly illustrate either the deployed requirements of CIS organizations or the required support to metropolitan and local area networks or their peripherals. The WTIS organization at the wing is generally structured to reflect the responsibility areas described in the section on Community Jobs or Roles—Static Employment – Main Operating Base (see above).

Organizational Structure – Deployed – Expeditionary. The deployed construct has the CIS Flt Comd reporting to a WLogO equivalent, referred to as the Officer Commanding Mission Support Squadron. The AFSC is in the initial spiral of implementation, and as a result, the MSS OC in the interim reports to the WLogO. The MSS chain of command may report directly to the WComd as successive capability spirals are invoked.

Six Mission Support Units will be established under the evolving Air Force Support Capability²¹ initiative—one each located at 3 Wing Bagotville, 4 Wing Cold Lake, 8 Wing Trenton, 14 Wing Greenwood, 17 Wing Winnipeg and 19 Wing Comox. Each MSU will have functional squadrons providing close and integral support capabilities in the areas of Airfield Engineering, Communications and Information Systems, Logistics and Human Resources and Finance. Each functional component will be organized with an officer commanding and a multiple of functional flights to sustain rotations. The functional CIS Flt will provide a near complete range of close and integral support activities to cover CAS Planning Guidance scenarios. For contingencies, a task tailored, mission-specific CIS Flt will be force generated from the MSU and, as necessary, from specialist or other units, based on the required support. The 8 ACCS in Trenton and the two transportable heavy radar squadrons form part of the CIS specialist capabilities not resident within the AFSC/CIS construct. The generic CIS Flt construct to the section level is depicted in Figure 7.4.

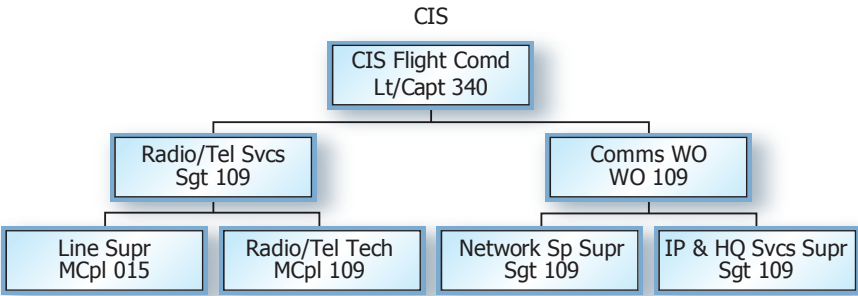


FIGURE 7.4. DEPLOYED/EXPEDITIONARY GENERIC CIS ORGANIZATION

Relationship of the Communication and Information Services Community with other Communities. The CIS community has a natural affinity towards the intelligence and operational communities due to its role in providing airfield support and the critical

21 Refer to the AFSC Statement of Requirement (SOR) v3.5 dated 29 Jun 05 and the AFSC Master Implementation Plan (MIP) 15 Aug 05 for in-depth initiative view. These documents are available at the website address - winnipeg.mil.ca/afsc/subjects/key%20docs_e.htm. Accessed 29 Nov 2006.

systems to enable the commander to exercise command and control. However, the bulk of the TIS/CIS community interaction is internal to the WLog branch or MSU and external to Level 1 Group Principals for resources to ensure the continued availability and sustainment of TIS/CIS systems.

Perhaps the most significant relational difference between MOB/garrison and the deployed setting is the requirement for the deployed leadership to work with the unknown. The CIS Flt is expected to establish capabilities with host nation and other local telecommunications providers. This task requires a different and uncertain interface with the local culture and economy and creates special dynamics. Training, such as for reconnaissance and awareness of how to work in an uncertain and dynamic environment, is important to the timely and successful execution of the CIS Flt's support mission.

The other relational difference on deployments is the need for the CIS Flt to interface with a National Command and Control Information System (NCCIS) detachment in theatre. This reporting and interface is not required in the MOB/garrison, and the relationship is not exercised prior to deployment. The relationship is thus akin to a cold start during a Winnipeg deep-freeze. That is to say, it takes time to run effectively; and this is to be expected given the relational unfamiliarity.

Description of the Role of Reserves in the Communication and Information Services Community. The role of Air Reserves within the Air Force TIS/CIS community is principally as augmentation to static garrison operations and higher headquarters. Some Reservists augment deployments on an as available volunteer basis. The development of formed Reserve units like those established by the Airfield Engineers has not been seen as feasible for the Air Force CIS community. The large majority of Air Reservists employed by the CIS community have had previous Regular Force experience. Some Reservists have been trained ab initio, but they do not usually stay with the Air Reserves and tend to transfer to the Regular Force or are drawn away from the CF by industry due to the high demand for their skills.

Factors that Affect Culture and Leadership in the Communication and Information Services Community.

Internal Factors

Support units in the MOB/garrison environment are led at the branch level by a LCol (WLogO) and at the section (WTISS) level by a Maj. On deployed operations similar organizations are led by officers one rank lower than at home, as the MSS is commanded by a Maj and the CIS Flt by a Capt. Although it is recognized that while on deployment the span of responsibility is reduced somewhat and is more focussed, the deployment can present challenges related to experience levels and breadth of knowledge of these leaders, particularly for the captains.

The concern over the general lack of experienced captains as CIS Flt Comds is mitigated somewhat within the CIS Flt construct in that a senior WTISS WO is sent with the Flt on deployments. Furthermore, since the Capt is not necessarily engaged in Information Security Staff Officer / COMSEC custodian functions at the wing, this training is being offered during readiness cycle preparations. Additionally, career training opportunities are being utilized to round out and improve junior officers' knowledge through the Air

Operations Command and Control Information Systems (AOCCIS) Course,²² the Air Force Officers Basic Course (AFOBC)²³ and C²²⁴ courses. Further, as the field training exercises continue to evolve, they will provide a tremendous hands-on and focussed mechanism for developing leadership at all levels of the CIS Flt and the MSS as a whole, while creating a better degree of unit cohesion.

The Air Force CIS community has some concerns about senior officer command opportunities. On some wings the Logistics community has established Deputy Wing Logistics Officer positions at the Maj rank level not only to assist the WLogO but also to prepare selected senior officers for the broader scope of functional responsibility that comes with commanding an MSS. This helps to position officers in the Logistics community well to act as the MSS officer commanding while deployed. The CELE(Air) Maj is not offered this exposure within the MOB/garrison, and, therefore is somewhat disadvantaged for command opportunities on deployment as a result.

The AFSC construct is a very important and positive step to inculcate Air Force support personnel into a formed unit culture that lends itself to capability ownership and group cohesion, and ultimately unit identity, responsiveness and effectiveness.

External Factors

The tasking of CIS Flt personnel either as a formed sub-unit or as individuals to augment operational-level organizations or other services' tactical units presents challenges in terms of understanding the environment being supported in terms of the leadership culture, requirements awareness, and differing C² and employment cultures. As well, the technicians face the prospect of supporting C² systems that they are not ordinarily completely trained to maintain. Formations like the CANOSCOM will place not only a draw on the Air Force ability to support environmental deployments, but also will require an expanded understanding or knowledge of the operational culture and associated training.

Who is considered to be in the Air Force in the Communication and Information Services Community? The CIS community is rather small within the Air Force (i.e., approximately 670 personnel out of 14,500 or just under 5 percent) supporting static and deployed activities across 13 wings and two headquarters. As we have seen, the Air Force CIS community is also part of the CF Communications and Electronics Branch; therefore, who is considered to be part of the Air Force is dependent upon context. As an example, for personnel tasking for the purpose of force generating to deploy in support of Air Force or DCDS-directed operations, the pool of resources is based on the 670 Air Force CIS personnel in CC3 only (Capability Component 3, i.e., those resources controlled by the Chief of the Air Staff). However, when training and career management are considered, the picture becomes more complicated. Training is generally offered to technicians and officers based on the colour of their uniform by the Canadian Forces School of Communications and Electronics and/or out-of-service entities. Likewise, positions in other Capability Components, namely Assistant Deputy Minister (Materiel) [ADM (Mat)]/DGAEPM (R&CS) and Assistant Deputy Minister (Information Management [ADM(IM)]/IM Group staff or projects, are identified as either Air Force, Army or both. Career paths may see

²² CELE(Air) career course offered by the Canadian Forces School of Communications and Electronics at Kingston.

²³ Junior Air Force officer course taught by CFSAS at Winnipeg.

²⁴ This recently developed course is offered by the CCC (now Deployment Readiness Training Standards and Evaluation Team [DRT SET]) in Trenton to those in the ranks of Sgt to Maj and is focused on deployment skills including recee.

officers in particular flow through these outside CC3 organizations. Therefore, those in the CIS community wearing light blue uniforms may or may not see themselves as belonging to the Air Force depending on their employment pattern.

Conclusion and Summary of Main Issues. The AFSC initiative represents a huge step towards focussing on deployment requirements and implementation. That focus will allow for a greater emphasis on the personal, occupational and leadership skills essential for success. The deployment environment with its inherent uncertainty, unknowns and hence dynamics requires a better prepared and focussed leadership that can react appropriately and ensure this success. In particular senior NCMs and junior officers must have the competencies and skills to lead in such an environment.

Air Force Military Police²⁵

Introduction. Prior to unification the security and police functions of each service (Army, RCN and RCAF) were conducted quite differently by each service. For the RCAF, the Air Force Police (AFP) had the dual responsibility of performing both police and security duties and were under the command of the Station Commander of the station on which they served.

The initial amalgamation of all police and security elements of the CF was first effected in October 1964 by the formation of the Directorate of Security at Canadian Forces Headquarters. With the introduction of the CF Functional Command structure in April 1966, the security staffs and Provost Marshals (PMs) in existing single service command organizations were eliminated, command and base security officers were appointed at the newly formed HQs, and the various investigative elements of the three services were amalgamated into a single organization called the Special Investigation Unit (SIU). To achieve a common approach throughout the forces, security and police functions were regrouped into three main categories: (1) personnel security, (2) police and custody, and (3) security of information and materiel. A single occupation of Military Police was created which replaced five previous occupations and provided standards for the training required of all non-commissioned members employed in the police and security field.

In June 1966, Major-General Turcot was directed to examine the role, organization and responsibility for security in the CF and to make recommendations for any revisions. At the time there were two philosophies in the Police, Intelligence and Security organizations. The Director General Intelligence (DGI) saw a distinction between police and security functions, but believed that there should be a closer relationship between security and intelligence. The Chief of Personnel, on the other hand, saw the police and security functions as complementary. The Turcot Report, completed on 22 July 1966, agreed with the DGI position and recommended that the responsibility for security should be placed under the DGI.

In January 1967, the CDS directed DGI to undertake a management analysis with a view to recommending the future management system for Intelligence, Security and Military Police in the Canadian Armed Forces. This study became known as the Piquet Report. The DGI Working Group submitted its study in March 1967 in which it was concluded that security, intelligence, and police functions should be managed by a single entity under the Directorate General Intelligence and Security in the VCDS Branch. The new branch was to be named the Security Branch, and it was officially created on 1 February 1968. The recommendations of the Piquet Report were implemented by the CDS on 3 May 1967 and

²⁵ Information compiled by Maj R.W. Francis, Force Protection Coordination, 1 Canadian Air Division HQ, Provost Marshal Office.

by 1968, the Officer Specifications for security, intelligence, and police functions were in draft form and included five sub-classifications: Military Police, Investigation, Intelligence, Imagery Interpretation and Interrogation. With the formation of a unified Security Branch came a need to replace the previous corps and service badges, and the use of the Totemic Thunderbird as the symbol for the Security Branch arose out of the recommendations of the Insignia Steering Group appointed by DGI on 15 May 1967.

In 1970, the Branch unofficially deleted the Military Police sub-classification at the officer level since the Basic Officer Specifications included all the tasks of the sub-classification. In effect, the Branch had adopted a four sub-classification structure. Therefore, between 1971 and 1974, the new Security Services Basic Officer course was the Branch qualifying course and consisted of 84 days devoted to police/security instruction and only 3 days to intelligence subjects.

In June 1975, the Director Military Occupational Structures (DMOS) issued a draft occupational analysis report on the Security (Sec 81) officer classification in which it was found that the activities performed by Sec(Int) officers bore little resemblance to those performed by Sec(MP) officers. The Branch was, therefore, restructured into two classifications vice the five sub-classifications that existed at the time. By August 1975, after another review, DGIS rejected the idea of two separate classifications within one Security Branch and proposed one classification for Police and one for Intelligence. After 1976, training and employment of Security Branch Officers was in consonance with the dual structure of the Branch and proved superior to pre-1975 approaches. The dual structure also formalized and clearly defined the uniqueness of the police and intelligence functions and institutionalized the security function in the police side of the structure as had been the RCAF practice.

In 1978, the Craven Report proposed that ADM(Personnel) separate the CF Police and Intelligence personnel comprising the unified Security Branch and reorganize them into a Security Branch and a new Intelligence Branch. Following further studies, discussions and recommendations, DGIS concurred with the Craven Report and, on 3 December 1981, the CDS directed that separate Security and Intelligence Branches, each containing the applicable officer classifications and non-commissioned trades, be established, with an implementation target date of 1 October 1982. On 29 October 1982, a ceremony was held at the Canadian Forces School of Intelligence and Security (CFSIS) which inaugurated the new Intelligence Branch and rededicated the Security Branch.

Throughout this period, Military Police (MP) serving with the Air Force maintained a primarily security focus, and the Air Force MP professional security services transitioned to a more corporate nature. This period also saw the removal of its integral Military Working Dog capability, coincident with the removal of nuclear material from Air Force bases.

Tremendous efforts were made by the Air Force Senior Staff Officer Security staff during the late 1990s to resurrect the concept of Airfield Security Forces. While doctrine and training had been approved, culminating in the establishment of two Airfield Security Force units with specialist equipment (14 ASF and 8 ASF), the announcement of force reductions resulted in no personnel being assigned to the establishment of these organizations. The impact of force reduction further eroded the ability of the Air Force MPs to fulfil their security requirements, rendering established doctrine invalid.

Numerous changes to the Security Branch followed the infamous Airborne Regiment deployment to Somalia, and the Branch was the subject of several in depth studies

culminating in the Dickson and Belzile Reports. These reports emphasized the investigative independence of the Canadian Forces Military Police, and resulted in an increased focus on policing and investigations. This included the establishment of the Canadian Forces Provost Marshal position, the creation of the Military Police Code of Professional Conduct (both enshrined in the National Defence Act), and the establishment of the CF National Investigation Service (CFNIS). However, without any compensatory increases to personnel establishments, there was a corresponding decrease in the Branch’s ability to carry out its security mandate. As a result, responsibility for some security functions in DND and the CF was devolved among various other entities, most notably ADM (IM) and DG Int.

The current operating environments of the Air Force and events following the tragic events of 9/11 have reinforced the primacy of the traditional role of the Military Police within the Air Force – security and force protection. Air Force MPs are currently in a state of transition in an effort to re-establish a highly effective and efficient airfield security and defence capability. With CF transformation and the appointment of Comd 1 Cdn Air Div as the Combined Force Air Component Commander (CFACC), the 1 Canadian Air Division Provost Marshal position also transformed. Now, as A3 Force Protection and Provost Marshal, reporting to A3 Aerospace Control and Force Protection Readiness, the incumbent is assigned the responsibility for coordinating Force Protection within the Air Force. This “holistic approach” will provide the Air Force with a central coordination point for force protection issues within the Air Force, and will seek to balance emphasis on the four pillars of force protection, namely: active defence, passive defence, protective security, and recuperation.

Community Jobs or Roles. Doctrinally, the roles and tasks of MP remain consistent between the strategic and operational HQs. The MP functions and their relationships are shown in Figure 7.5. While not all-encompassing lists, some of the roles and tasks for each function are listed in Table 7.2. The fundamental differences in approaches between the Environments and the Strategic HQ stem from the emphasis placed upon the various functions.



FIGURE 7.5. MILITARY POLICE FUNCTIONS

Force Protection	Policing	Security
<ul style="list-style-type: none">• Road movement planning, recce & signing• Traffic control• Straggler control• Population movement control• CBRN monitoring & marking• Assist area damage control operations• Liaison• Detention Ops – facilities and admin• Prisoner escort• Prisoner of War Ops	<ul style="list-style-type: none">• Patrols• Crime Prevention / Preventative Policing• Law enforcement• Conduct investigations• Assist customs• Host nation police re construction training	<ul style="list-style-type: none">• Security advice & planning• Personnel security program• Preparedness & Business Continuity planning• Threat Risk Assessments / Threat Risk Vulnerability Assessments• Physical security of material, information, IT, infrastructure• Physical security surveys / Vulnerability Assessments• Identification & entry card services• Access Control• Air Marshal / Flight Security• Support to locally engaged persons hiring process• VIP security tasks• Security awareness• Security briefing/ debriefing• OPSEC Planning• Security investigations• Close Personal Protection

TABLE 7.2. MILITARY POLICE ROLES AND TASKS BY FUNCTION

Organizational Structure – General. MP remain under the command of their respective commanders at each level of command. However, the MP technical net (or technical chain of command) has been officially sanctioned and is incorporated into the National Defence Act; it is arguably the most robust technical net in the CF (with the exception of Health Services). Within this structure, wing MPs are technically accountable and responsible to the 1 Cdn Air Div Provost Marshal, who in turn, remains technically accountable and responsible to the CF Provost Marshal. Of the three core MP functions (security, police and support to operations), policing remains the exclusive purview of the CF Provost Marshal, a system designed to ensure the integrity of the investigative / military justice processes and to guard against undue influence by the chain of command. With recent CF transformation initiatives, there are numerous efforts to unify command of the MP under the CF Provost Marshal.

Organizational Structure – Static Employment – Main Operating Base. In its simplest form, the MP Structure in garrison/wing consists of:

- a. a command element normally consisting of an officer, an NCM (MWO or WO), and administrative staff;
- b. a patrols section, normally under a WO or Sgt, responsible for the MP patrols that are dispatched routinely to address garrison and supported units’ security and police needs;

- c. an investigations section, consisting of a Sgt or MCpl and small team of investigators to address more prolonged investigations, but are investigations that are not within the CFNIS's mandate; and
- d. a security section, normally under a Sgt, to address departmental security requirements, including IT security, identification services, physical security surveys, and personnel security.

Policies established by the CF Provost Marshal call for specialized police functions that may or may not be secondary tasks on a wing depending on environment and establishment, for example, Court NCO, Victims Assistance, Use of Force Instructor, Evidence Custodians, Lost and Found, and Service Detainee Custodian.

Organizational Structure – Deployed – Expeditionary. For deployed Air Force operations, numerous options are being pursued, but it is presently deemed preferable to layer MP support to address integral, close and general support requirements. While official options for airfield security and defence are being prepared for the Air Force leadership, based upon initial staff estimates, the 1 Cdn Air Div Provost Marshal has recommended that Air Force MP support be structured in building blocks going from a 3-person fire team, to a 10-person squad, to a 52-person flight. Additional capabilities such as indirect fire support, and CBRN could then be added on to provide a comprehensive Force Protection capability, once these building blocks have been established. With this model in mind, MP support would be defined as follows:

- a. Integral Support – consisting of individual Air Marshals assigned to ensure the integrity of an aircraft's cabin during flight, and Ground Security Specialists to provide point protection around the airframe (minimum standard should consist of an airfield security squad of 10 persons);
- b. Close Support – to provide airfield security to the perimeter of the Canadian Sector within a coalition airfield (minimum standard should consist of a flight), as well as providing limited other MP services; and
- c. General Support – to provide airfield defence beyond the perimeter of the airfield (presently assumed to be an Army function), as well as specialized MP support (i.e., CFNIS, Canadian Forces National Counter Intelligence Unit, and Certified Protection Professional services) as well as more general, corporate-type MP support (e.g., security / Force Protection surveys and investigations below the CFNIS investigative threshold).

Relationship of the MP Community with other Communities. MP relations within the Defence Team are presently defined by the interaction between Provost Marshals at the tactical and operational levels and the Command Team at each level, as well as the interactions between the individual MPs with the rest of the Defence Team. Military Police, as an integral part of the military and defence community, have the quintessential “community-based policing” model. They are soldiers, sailors and airmen/women who assist commanders with the maintenance of good order and discipline, and who provide expert advice on the protection of personnel, facilities, materiel, and information. They play a vital role in securing operations and providing the commander freedom of action.

Description of the Role of Reserves in the MP Community. The Air Reserve has insisted that all Reservists adhere to the same training standards as Regular Force members; therefore, Air Reserve MPs are selected and trained in the same manner as Regular Force MPs. First of all, the selection criteria imposed under the MP / MP Officer Assessment

Centre process, where applicants must at least have a 2-year certificate in Security and Law Enforcement from a recognized institution or university degree before they are able to undergo the Assessment Centre process, has restricted the accessibility of the MP community to Reservists. This training standards policy also means that, even if selected, the duration of MP training can be an issue for Reservists. Finally, the issue of MPs' accountability to the CF Provost Marshal (and the implications of the various oversight mechanisms including NDHQ / Deputy Provost Marshal Professional Standards and the independent MP Complaint Commission) has also limited the growth of the Air Reserve Augmentation Flight MP organization, thereby severely curtailing accessibility to this career field for Reservists.

Factors that Affect Culture and Leadership in the MP Community. The dichotomy of control over MPs between the operational chain of command, which exercises command over MP assets and the CF Provost Marshal, who exercises technical control over policing, demands a flexible approach and due consideration to the unique requirements of each chain of command. While both chains share a common intent (Air Force MPs providing a broad spectrum of police and security services to the Air Force), the emphasis of each chain is clearly different. The operational chain of command's emphasis is on security and force protection; while the CF Provost Marshal, or technical chain, focuses on policing operations. These differing priorities sometimes place competing demands on scarce resources. When these situations occur they must be mitigated by good communication between the technical net and the chain of command.

Who is considered to be in the Air Force in the MP Community? Air Force MP consists of those MPs wearing Air Force DEU, as well as MP from the other environments currently employed with the Air Force. There are currently 265 Military Police (all ranks) assigned to the Air Force.

Conclusion and Summary of Main Issues. The main issues revolve around structuring the Air Force MP to be able to support both domestic and deployed operations. This cannot be done in isolation, particularly given current CF Transformation initiatives. The ability for MP to provide the myriad of police and security services to the CF is hampered by a shortage of MP (relative to taskings) and a lack of formed units to respond to taskings. For example, while responsible to provide a General Support capability, there is no formed Joint MP Unit to provide personnel to deployed taskings, and Force Generation is left to the environmental commands. This situation sometimes results in conflicting priorities and a piecemeal approach to MP operational support. The end result is that the Air Force MP are currently stretched too thin. Between NORAD and NATO commitments, which require dedicated forces to provide security to Air Force assets, commitments to current deployed operations like Task Force Afghanistan, commitments to general support activities (Military Security Guard Unit Tactical Assistance, Military Police Assessment Centers, Cadet Summer Training Camp augmentation, Instructor augmentation, etc.), and commitments to day-to-day domestic operations (including adherence to Military Police Technical Policies) the Military Police occupation is stressed. Notwithstanding these trying circumstances, the Military Police Branch is one of the most tightly knit organizations in the CF, and the relationship between the CFPM, the Environmental Provost Marshals, and the Operational HQ PMs remains cooperative and strong, mostly through the auspices of Branch Council. Recent work on the MP Strategic Plan, a plan to enhance Military Police services to the CF spearheaded by the CFPM, will only strengthen this relationship.

Military Police are a “force multiplier” and a key component of military operations. They provide the ideal skill sets to bridge the gap between the military, civilian authorities and civilian police forces, and this applies equally to domestic and deployed operations. Domestically, MP work closely with their civilian counterparts and thus provide the commander with an important liaison capability. In deployed operations, MP can play a key role in establishing good governance (i.e., working in failed states to train local police and security elements) and this capability should be exploited as a powerful force enabler, particularly if Canada is determined to continue its 3D approach to international affairs.

Air Mobility and Search and Rescue²⁶

Introduction. Air Mobility and Search and Rescue is a very complex community. It is currently comprised of seven fleets of aircraft: Airbus 310 (CC150), Buffalo (CC115), Challenger (CC144), Cormorant (CH149), Griffon (CH146), Hercules (CC130), and Twin Otter (CC138).²⁷ These aircraft are used in a number of different roles.

Air Mobility consists of four distinct roles: Strategic Airlift (SAT), Tactical Airlift (TAT), Air-to-Air Refuelling (AAR) and Search and Rescue (SAR). A sub-set of SAT is the VIP/VVIP transport role. Assets are dispersed across the country at Goose Bay, Gander, Greenwood, Bagotville, Trenton, Winnipeg, Cold Lake, Yellowknife and Comox. The diversity of fleets, roles and geography leads to functional dissimilarities within Air Mobility, as different squadrons operate a variety of different platforms in support of the different roles. As an example, 437 Squadron in Trenton employs the CC150 in the SAT, VIP and shortly the AAR role; 412 Sqn in Ottawa uses the CC144 for SAT and VIP transport; 442 Sqn in Comox utilizes the CC115 in the SAR and secondary SAT role; and 440 Sqn in Yellowknife employs the CC138 for SAT and a secondary SAR role. The CH149 Cormorant is used to conduct SAR operations at four locations across Canada: Gander, Greenwood, Trenton and Comox. The CH146 Griffon is utilized for combat support and SAR roles at Goose Bay, Bagotville and Cold Lake. The CC130 Hercules is employed in all four roles in three different locations across Canada: Greenwood, Trenton and Winnipeg. SAR and SAT roles are common to all three of these locations while AAR and TAT are unique to Winnipeg and Trenton respectively.

SAT airlift and SAR may be conducted in expeditionary, deployed or static environments. The TAT and AAR roles are primarily employed in expeditionary or deployed environments. Air Mobility has always trained and been structured to operate globally, independently and virtually autonomously when necessary. Employment can range from mass deployment of all units and assets to the temporary use of a single airframe. It is critical that Air Mobility personnel possess the requisite skill-sets and knowledge to operate globally and independently while retaining links to command and control elements without the standard home-base infrastructure.

The Air Lift Control Elements (ALCE) and deployed Search Headquarters, allow SAT/TAT, AAR and SAR operations to function independently in any location with minimum lead time, workforce and equipment. An ALCE enables Air Mobility to rapidly react to situations without the normal cumbersome infrastructure required of a full-scale deployment.

²⁶ This section was written by LCol Andy Maziarski, Air Mobility and SAR, Canadian Forces Aerospace Warfare Centre, 8 Wing Trenton; Maj Kevin MacDonald, Air Reserve and Mobility, CFAWC; and Maj Mike Graham Air Mobility and SAR 3, CFAWC.

²⁷ Facts on the aircraft fleets and associated Wings can be found at airforce.mil.ca/dairpa/subjects/aircraftwing/aircraftwing_e.htm or www.airforce.forces.gc.ca/today5_e.asp. Accessed 12 Sep 2006.

Community Jobs or Roles. Airlift is the transport, via aircraft, of personnel and/or materiel from one location to another. The distinction between strategic and tactical airlift is that strategic airlift occurs between theatres of operation (inter-theatre airlift) and tactical airlift occurs within a theatre of operation (intra-theatre airlift). The decision to use inter-theatre airlift (e.g., airlift that goes from Canada directly to a theatre of operations) versus tactical airlift (e.g., sending loads from Canada to an intermediate point outside of a theatre of operations and then delivering the load to the theatre of operations by tactical airlift) may depend upon the perceived threat level within the theatre and commensurate self-protection capabilities required to fly in that theatre. A higher threat level would dictate that tactical vice strategic airlift be employed along with specific tactics and equipment mitigating specific threats. The primary strategic airlift platform is the CC150. The CC130 is the primary tactical airlift platform, although it does some strategic airlift. The CC144 is utilized for VIP transport and some strategic airlift. The CC138, the CC115 and the two helicopters within Air Mobility can be utilized for limited airlift roles. Within airlift is a sub-element of aero-medical evacuation (aero-medevac), which utilizes the expertise of specially trained medical personnel during the evacuation of casualties on board aircraft.

For expeditionary environments, both primary strategic and tactical airlift platforms are well equipped and the crews well trained to operate globally, independently and virtually autonomously, especially the CC130. The CC130 is a robust and versatile airlift vehicle that is extremely well adapted for employment in austere theatres, and can be employed from both prepared and unprepared surfaces. As part of a deployed operation, the CC130 and, with some added infrastructure, the CC150 can readily adapt to be interoperable as part of a multinational force. The different environments pose very little difference to the procedures employed by the various platforms for airlift.

AAR is a force enhancer/multiplier. Like airlift, it can be divided into strategic and tactical, similarly distinguished by being inter-theatre or intra-theatre. Nominally, the CC150T will be considered a strategic tanker, while the CC130T is considered to be a tactical tanker. However, CC130Ts have been used effectively to assist with fighter inter-theatre deployment. Both airframes can be utilized within an air battle campaign in very similar circumstances, differentiated primarily by the altitude and speed of the tanking sequences as well as the volume of fuel that a platform is able to deliver during a single flight. The different environments posed by expeditionary and deployed operations do not result in exceptional differences for AAR. There is interoperability of equipment, crews and procedures that facilitate multinational force deployments.

SAR is a non-military mandate of DND. The primary resources dedicated to this role are the CC115, CC130, CH149 and the CH146 aircraft. They are situated in various combinations across the country, in order to best meet the needs of each geographically diverse location. Consistent with the rest of Air Mobility, SAR crews are trained and prepared to operate independently and autonomously. Command and control of SAR resources is provided through the Rescue Coordination Centres via a Search Headquarters during a full-scale, deployed search.

Organizational Structure. Air Mobility crews are able to operate globally, normally in all environments and weather, day or night. This is accomplished through a combination of thorough training and adaptable equipment. In the static, or main operating base, environment, a comprehensive, multi-level command and control structure regulates Air Mobility operations. Tasking is coordinated by 1 Canadian Air Division, and taskings are filtered through the base/wing operations at each unit to the squadron and eventually to the

assigned crew. In an expeditionary environment, the tasking process may be more direct, perhaps directly from 1 Cdn Air Div or through base/wing operations. This tasking process normally circumvents the normal unit chain in the case of a single aircraft, and is controlled through an Airlift Control Element if the expeditionary force is larger and more permanent in nature. On deployed operations, command and control of air mobility resources is delegated to the commander of the deployed operation, who might be either a Canadian commander or a commander from another nation during a multinational operation and who is typically outside the normal Air Mobility chain of command.

During wartime or multinational operations, air assets are tasked by an Air Tasking Order from a central authority, the Joint Force Air Component Commander (JFACC). This order sets out the specific mission(s) and the resources available to complete the mission(s). At the unit level, an Operations Office determines how the tasking is to be accomplished using the resources available. This structure is employed both in garrison and while deployed.

Relationship of the Air Mobility and Search and Rescue Community with other Communities. Air Mobility functions in virtually seamless coordination with other communities with liaison occurring at all levels of planning and execution. As a provider of services, from airlift to SAR to AAR and aero-medevac, Air Mobility operations are, for the most part, conducted in support of another community. In a static environment, within the normal chain of command, this relationship is normally problem-free. At the start of expeditionary and deployed operations, there can sometimes be problems defining the parameters under which the Air Mobility assets are to conduct their missions. These minor growing pains are usually quickly overcome by referencing the regulatory procedures by which the assets are expected to operate and through coordination amongst all parties involved.

Description of the Role of Reserves in the Air Mobility and Search and Rescue Community. Air Reserves are utilized within Air Mobility in virtually the same manner as Regular Force members. Possessing the same skill-sets and experience, often as a result of previous Regular Force service, Reservists are virtually interchangeable with their Regular Force counterparts. Due to the chronic personnel shortages within the Regular Force establishment, often complicated by reduced experience levels, the utilization of Reservists is often crucial to the sustainability of operations, both at the home base and abroad.

Reservists are deployed in the same manner as their Regular Force counterparts, with the exception of deployments being a voluntary commitment on the part of Reservists. Often, Reservists are employed to backfill the vacancies caused by the deployment of Regular Force personnel, and Reservists are regularly called upon to fill in the gaps in Air Mobility units from private to Acting Commanding Officers to senior staff officers at all levels of headquarters. Reservists are often very beneficial to the units that employ them, due to the continuity that they are able to provide and their extensive experience.

Factors that Affect Culture and Leadership in the Air Mobility and Search and Rescue Community. Air Mobility's culture and leadership is greatly influenced by a focus that is primarily concerned with the support of other capabilities and weapons systems. This function does not diminish the importance of Air Mobility nor make it subservient to other functions in combined and joint operations, because the delivery of all other capabilities is greatly dependent on the support that Air Mobility provides. Until recently, however, other weapons platforms and communities have seemingly received more attention than Air Mobility, and not enough long-term focus, priority and action have

been devoted to addressing future Air Mobility requirements. New platforms have been added in an ad hoc fashion without much forethought as to what capabilities they bring to the Air Force. Recent examples of this process are the CC150 and CC144 acquisitions, which are civilian airframes with limited capabilities for operating in medium to high threat environments.

The fact that Air Mobility is not always viewed by other communities as being at the “pointy end” of an air campaign has contributed to the perception by some that it is less operational than other communities such as fighter or maritime patrol. The reality is that Air Mobility is, for the most part, first in and last out of any war or operation. This is especially true in the case of expeditionary force employment. Recent examples of this characteristic of Air Mobility include Kosovo and the CF’s ongoing operations in Southwest Asia and Afghanistan. In the latter case, Air Mobility continues to provide essential inter-theatre re-supply and personnel movement functions and will continue to do so into the foreseeable future.

Another erroneous perception is that Air Mobility crews are satisfied with nothing less than expensive hotels and lavish restaurants such as might be enjoyed by commercial airline crews. The fact that Air Mobility crews are typically the first to arrive during any operation normally means that no forward operating base has been established, and hence the only available accommodation is commercial lodging. For shorter operations it is simply cheaper to use commercial lodging and restaurants because there is an enormous cost in time, personnel and money associated with erecting a semi-permanent base. During extended operations, it is common for Air Mobility to work out of a garrison style establishment.

A further distinction, which sets Air Mobility apart from other Air Force communities, is the way in which it trains and fights. For other forces such as the fighter community and combat support functions, force generation is accomplished, for the most part, in garrison. Operational or force employment for these communities is, typically, sporadic and short lived. For this reason, force generation can be more structured and predictable for these forces. Air Mobility, by contrast, conducts a large percentage of its force generation while conducting force employment functions, and, to a certain extent, reduced resources have necessitated this situation. Furthermore, Air Mobility needs less time to reconstitute in garrison which dictates that more time be spent conducting force generation while deployed. Due to the limited training opportunities at their disposal, Air Mobility crews are often forced to double and triple their size in order to take advantage of scarce aircraft and flying time availability; the resultant training is watered-down and less than ideal. These methods, far from adding to crew proficiency, are often required just to maintain the regulated flying times for crew currency.

It is important that Air Mobility sustains the depth of experience and the availability of resources to enable the training of operational aircrew. Experience levels of aircrew and ground crew alike continue to be eroded by commercial airline hiring and demographic trends. Pilots and aircraft maintenance personnel are highly trained and possess an extremely marketable skill-set. For this reason, the civilian airline industry is extremely proactive trying to hire them, as military pilots, for instance, can be hired by a civilian company and be qualified on a specific aircraft type less than one month later. Furthermore, this company has the benefit of not having to foot the tremendous cost associated with training this individual.

Lately, operational tempo has dictated that Air Mobility aircrew spend a considerable amount of time away from home. For this reason, for those seeking domestic stability, the lure of airline employment is a strong one. As a result of this trend, more and more we see that leadership roles are being assumed by occupations other than those within the pilot community of Air Mobility.

Who is considered to be in the Air Force in the Air Mobility and Search and Rescue Community? Within Air Mobility, all occupations or trades are considered to be representative of the Air Force. This includes aircrew, technicians, air traffic controllers and all other support personnel. Aircrew also includes those not usually associated with air combat operations, e.g., SAR Technicians, aero-medevac personnel, and flight attendants and flight stewards are often from non-Air Force military occupations. Therefore, Air Mobility cultivates acceptance of large, combined crews that include all crewmembers required to conduct the mission. There is no distinction between crewmembers from environments (Navy and Army) and those who have always worked within the Air Force.

Conclusion and Summary of Main Issues. Compared to the other communities, most of which have a single airframe and a single or similar roles and functions, Air Mobility is much more diverse and complex. This presents challenges in training, inter-unit employment and command and control. While this diversity and complexity is well understood and managed from within, it is often misunderstood by external agencies, which tends to cause problems with the allocation of resources and with higher level command and control processes. More Air Mobility representation at the strategic levels of command would bode well to consolidate a better understanding of its capabilities, methodology and standard operating procedures. Air Mobility is a conglomeration of fleets and roles that provides support to a variety of commanders. There are challenges inherent in the diversity of fleets and roles that affect training, operations and career progression. One size does not fit all in this case, and consequently, this would provide an interesting research opportunity to determine how best to organize, employ and command Air Mobility forces without adversely affecting the complexity and diversity of its functioning.

Fighter Force²⁸

Introduction. Until the introduction of the CF18 there were three distinct fighter air forces in the Canadian Air Force: the European air-to-ground CF104 force, the NORAD CF101 interceptor force, and the Canadian tactical CF5 force. They had distinct roles and characteristics, and cross-fertilization among them was on an exceptional basis. The CF18 replaced the three fighter fleets in the 1980s, and was employed initially in the NORAD and NATO roles principally from main operating bases.

Expeditionary fighter forces have deployed under a changing concept of operations during the last 25 years. During the Cold War, and until 1990, only the CF5 force was tasked to deploy. It formed a rapid reactor squadron tasked under a NATO war plan to deploy to Norway, to a fixed location, and it relied, for the most part, on pre-positioned stores. In this scenario, squadrons deployed as units, retaining all the benefits of having trained and operated together.

Beginning with the Gulf War, and extending through the action in the former Yugoslavia, deployments were conducted by forming new units drawn from existing squadrons. Members of these units had to learn in-theatre to operate with their new wingmen, thus

²⁸ This section was written by LCol Tom Kupecz, Counter Surface Operations Land, Canadian Forces Aerospace Warfare Centre, 8 Wing Trenton; and LCol Richard Foster, A3 Fighters, 1 Canadian Air Division.

posing a significant combat risk and a reduction in effectiveness. Current planning for deployment envisions using existing formations, drawing from either 3 Wing Bagotville or 4 Wing Cold Lake, and providing pre-deployment training to crews as a unit. This is in keeping with the best principles of leadership and employment of forces.

Community Jobs or Roles. The Canadian fighter force can be employed in both air-to-air and air-to-ground roles. In garrison or deployed to Canadian sites, it is currently tasked for air defence under NORAD. Possible domestic roles could include reconnaissance and anti-shipping, although this would require development of capabilities that are not currently exercised. Current planning envisions that when deployed overseas, the fighter force would most likely be tasked for air-to-ground missions as part of a Canadian expeditionary force. The air-to-air role would apply in contingency situations, but it is not expected that the force would be deployed into theatres where air supremacy was not achieved.

Organizational Structure. Air assets are tasked by an Air Tasking Order from a central authority, normally the Joint Force Air Component Commander. This sets out the specific mission(s) and the resources available. At the unit level, an Operations Office determines how the tasking is to be accomplished using the forces assigned. This structure is employed whether in garrison or deployed.

Relationship of the Fighter Force Community with other Communities. Where the fighter force is tasked for air defence operations (NORAD), it works in seamless co-ordination with the US air defence community. In its roles in support of the Land and Maritime forces, through Joint Task Forces, liaison is done at all levels of planning and execution. Either deployed or in garrison, missions are tasked through the Air Tasking Order, created by the Air Component Commander in consultation with the other force elements involved, and directions are given for appropriate liaison with the other elements.

Description of the Role of Reserves in the Fighter Force Community. The Reserve Force provides individuals in specified positions, usually in staff positions, as augmentation when needed. Training and currency requirements usually preclude employment directly in operational flying positions.

Factors that Affect Culture and Leadership in the Fighter Force Community. Because success in fighter operations depends on skill and experience, leaders must have proven professional capability as fighter pilots to be credible. While traditionally a staff officer relieved the CO of administrative tasks, allowing the CO to lead from the front, in more recent times the squadron leadership became so involved in managing the unit that it was recognized that some subordinates were more current and qualified in the air than the leadership. This said, all leaders must have operational experience within the fighter community, and it is recognized that leaders must be “grown” within the community. Without credibility as a pilot, appropriate supervision, morale, and the overall effectiveness of the fighting unit diminishes.

Due to the extremely competitive nature of fighter operations, there is a traditional culture of combative spirit and élan within the fighter community, which has fostered a tolerance of individualism. In the modern technological air force it is recognized that this spirit must be tempered with a professional consideration of the far-reaching capabilities of the equipment. Along with this professionalism has developed a team spirit that is needed to make best use of modern weapons and communications.

The following example illustrates culture change in the fighter community. A marked change occurred in Canadian fighter squadrons with the introduction of the Air Combat Manoeuvring Instrumentation (ACMI) in the early 1980s. During wartime, the pilots who won engagements and survived gained status based on their skills. In peacetime, the natural competitive nature of fighter pilots demanded that status be gained through success in practice combat. Before the 1980s, air-to-air combat training in Canada was conducted without recording data, other than some audio taping of radio communications. Pilots sometimes took notes during flight between engagements, and in most cases it was necessary to rely on memory to replicate the fights during debriefings. Over time, the pilots who tended to “win” engagements in the debriefings were those with the strongest personalities and the best debriefing styles. In this way an informal hierarchy was established, and those who rose to the top were not necessarily the most skilled fliers.

Within weeks of operations with the ACMI, however, with recorded results that could not be disputed in debriefings, a new hierarchy had emerged. The computer showed, with no room for argument, which pilots were winning the fights and which were consistent targets. It was no longer possible to win air fights through debate. Former winners often became losers, and the old hierarchy was stood on its ear. It then became necessary to be a graceful loser, when the realities were indisputable.

This began a change in attitudes and culture, which saw the ascendancy of the demonstrably skilled pilots over the forceful personalities who had set the tone of fighter squadrons. The skilled technocrat was taking the place of the brawling warrior.

An example of culture change in the fighter community during this time was illustrated by the following anecdote:

When I first learned to fly the CF18, I was taught by CF104 and CF5 drivers who were still part of the old culture, and I was taught to ‘shut-up and do what I was told.’ There was not much room for thinking or debate. When I returned to the community after my ground tour, the atmosphere was completely different where the more senior fighter pilots now mentored the junior wingmen. It is now expected to have long de-briefs in order to maximize the learning experience. I do not think that this has diminished the war-fighting spirit of the community. A credible CO will promote and encourage the appropriate balance to maximize all pilots’ abilities within the squadron. We have learned to see through the ‘brawling warrior’ who was all ‘bar-talk,’ and could not deliver the goods in a 2 v 2.

Who is considered to be in the Air Force in the Fighter Force Community? Everyone on a fighter wing is part of the Air Force. This extends from the cleaner in the Officer’s Mess to the pilot firing the missile. One does not work without the other.

Conclusion and Summary of Main Issues. Historically the nature of air combat operations has driven the Fighter Force to emphasise spirit, élan, and individual expression, and it has been forgiving of excesses if these qualities are demonstrated. This has constituted a marked difference from the other flying communities, which required a more considered, sedate approach to flying.

Increasing emphasis in the CF on formal education and professional training, as well as the increasingly technological nature of the equipment, has added a new dimension to the

fighter pilot ethos. It is recognized that the fighting spirit must be broadened to embrace a concerted, methodical application to a wide spectrum of learning and expression.

The young officer in a flying position is faced with the dilemma of having to spend time at pursuits that do not obviously increase flying skills (survivability). There is a danger that the fighter pilot will evolve into a careful, learned equipment operator, with the resulting reduction in fighting effectiveness. It is critical for future leaders to foster the spirit of initiative and competition while putting the proper emphasis on the need for education. It must be remembered at all times that the Air Force is a fighting force which is meant to be sent in harm's way, and, therefore it must not create a culture that values educational credentials over skill at arms if this puts our warriors, and our nation, at risk.

Logistics²⁹

Introduction. The Logistics Branch is composed of three officer classifications, of which Logistics-Air officers serve primarily in the Air Force. There are six occupations for Non-Commissioned personnel in the Branch, and like the officers, each of those occupations have members who wear one of the three environmental uniforms. As is often the case, logisticians wearing one colour of uniform may be required to serve in another environment, regardless of affiliation. As such, logisticians are by nature very adaptable and are able to provide exceptional service to the Canadian Forces as a whole and are truly a tri-service or "purple" branch.

The Logistics Branch – A Brief History

During, and after, the First World War logistics support for the Canadian Air Force and RCAF developed in much the same way as it had in the Canadian Army, with separate organizations for transportation, supply, food services and finance. The scope and complexity of Canadian logistics expanded through the Second World War, which required significant effort in the post-war period to consolidate and refine the new supply and accounts procedures that had come in to practice quickly during the war.

With the unification of the CF in 1968, the Logistics Branch was formed from the amalgamation of a number of former service logistics-related organizations: the Royal Canadian Navy Supply Branch; the Royal Canadian Army Service Corps; the Royal Canadian Ordnance Corps; the Royal Canadian Army Pay Corps; the Royal Canadian Air Force Mobile Support Equipment Branch; the Royal Canadian Air Force Supply Branch; the Royal Canadian Air Force Finance Branch, and the Royal Canadian Air Force Food Services Branch.

From 1969 to 1975, new Logistics officers were initially trained to function in all specialties and environments. In 1975 training was changed to a single initial specialty and by 1978 initial environmental identification had also begun.

The Logistics NCM Military Occupation Codes (MOCs)³⁰ prior to 1997 were: Finance Clerk MOC 841; Steward MOC 862; Cook MOC 861; Supply Technician MOC 911; Ammunition Technician MOC 921; Traffic Technician MOC 933; and Mobile Support Equipment Operator MOC 935.

29 The contributors to this section were LCol J.J. P. Lessard, LCol W.B. MacLean, LCol G.R. Naldrett, Maj J.H.P.Y. Auger, Maj K.A. Heintzel, Maj P.J. Smith McBride, Maj A. T. Spott, Capt P.J. Comeau, Capt H.A. Rerrie, Capt J.C.S. Rioux, Capt C.W. Thorn.

30 The term MOC is now being replaced by MOSID (Military Occupation Structure Identification) in military lexicon to refer to jobs or occupations in the CF.

On 1 January 1998, the Finance Clerk 841 occupation was amalgamated with the Administration Clerk 831 and Construction Engineering Procedures Technician 631 occupations to form the newly created Resource Management Support Clerk 836 occupation. As will be discussed later, the Postal function was also included in Logistics at this time.

In 1999 the Steward occupation was transferred from the Logistics Branch to the Naval Operations Branch in order to provide stability for the occupation. Employment of Stewards is now almost exclusively within Maritime Command. Despite these changes, Steward training continues to take place at the Canadian Forces School of Administration and Logistics (CFSAL) and Stewards are still part of the shipboard Supply Department.

For the officers, it was felt that the existing occupational structure comprising seven military sub-occupations organized along functional lines was no longer optimal for the operational effectiveness of the CF. Most significantly, a need for closer alignment of the Service Support functions and structures with the Sea, Land and Air environments that they serve was identified as some were demanding that one must be a soldier, sailor or airman/airwoman first and a technician/specialist second. In addition, a series of technological and managerial initiatives were changing the configuration and delivery of Service Support activities. In late 1997, a study was commissioned to re-examine the way in which the Logistics Branch was organized and trained. By early 2000, it had been decided that the Personnel Administration and Postal occupations would be included in the redefined and reorganized Logistics Branch. Among other things, this redefinition called for an increased operational focus on the part of all logisticians.

What this meant was that the existing logistics structure consisting of seven officer sub-occupations plus Personnel Administration and Postal would change to one consisting of the following: Logistics-Sea (78B); Logistics-Land (78C); and Logistics-Air (78D).

In addition, the Logistics Branch goal is that all Logistics officers will acquire at least one of the five principal Logistics qualifications, namely: Supply Chain Management (AIHJ);³¹ Transportation (AIHK); Human Resources Management (AIHL); Financial Management (AIHM); and Food Services (AIHN). Resource management training will be embedded in all of these qualifications, and additional qualifications (postal, financial services, movements, ammunition) will only be provided to satisfy service requirements.

The Electrical and Mechanical Engineering Branch – A Brief History

The Electrical and Mechanical Engineering Branch has its roots in the Engineering division of the Royal Canadian Ordnance Corps (RCOC). Additionally, individual units had their own integral technicians and mechanics, who wore their unit's cap badge. On 15 May 1944 the Royal Canadian Electrical Mechanical Engineering (RCEME) Corps was formed, bringing all land equipment maintainers into a single branch.

Upon unification of the CF in 1968, the RCEME Corps became known as Land Ordnance Engineering (LORE), under a new branch hat badge. LORE was comprised of four trades and one officer classification. The trades were Vehicle Technician, Weapon Technician (Land), Ammunition Technician (transferred from RCOC), and Electro-Mechanical Technician (drawn from RCEME as well as the RCAF Mobile Support Equipment [MSE] Technician trade). The officer classification was made up of RCEME officers (the majority) and RCAF MSE engineering officers.

³¹ The four letter codes are the logistics qualification codes for the five principal logistics qualifications.

Prior to unification, MSE Technicians were organized as sections of Base Transport. With the new trades structures, the maintenance responsibilities were greatly expanded, with each organization now becoming responsible for local Militia and Cadet equipment as well as Regular Force equipment. Maintenance sections were, therefore, enlarged and by the mid-1980s, Base Maintenance (Land) sections were reporting directly to the Base Technical Services Officers (BTSOs).

The branch went through more name changes in the coming years, from LORE to Land Electrical and Mechanical Engineering in 1984, and finally Electrical and Mechanical Engineering (EME) in 1994. The year 1991 saw the return of the 1952 RCME-style branch hat badge with EME nomenclature.

The late 1970s to early 1980s saw a restructure of the trades into the four that exist today: 411 Vehicle Technician, 421 Weapon Technician, 434 Fire Control Systems (FCS) Technician and 441 Materials Technician.

Community Jobs or Roles. The 1 Canadian Air Division A4 Logistics (A4 Log) Mission Statement states that the role of Canadian Forces Air Logistics is to “ensure that logistics support is available and ready to generate, maintain, and sustain combat-capable, multipurpose air forces to meet Canada’s defence objectives.”³² It follows from this statement that the Air logistician must be well prepared and trained to support air operations anywhere from fully equipped MOBs to austere locations throughout the world. In order to provide these services logisticians are employed at every level of the CF, from the strategic down to the integral support provided to a tactical unit on a bare airfield.

From a logistics point of view, the key entities at the strategic level are the ADM (Mat), ADM Financial and Corporate Services—ADM(Fin CS)—and ADM Human Resources Military³³—ADM (HR-Mil)—organizations, all of which employ Air Force logisticians. These bodies set the national-level policies and procedures necessary to comply with legislative direction. These are then sent down to subordinate headquarters within the various environments and further passed to logisticians performing essential support services at the tactical level.

The strategic organizations also do much more for Air Force operations. For example, in the case of materiel support for the Air Force, acquisition of capital equipment and spare parts as well as the repair and overhaul of those aircraft spares is delivered through an ADM(Mat) organization called the Director General Aerospace Equipment Program Management. This organization is external to the Air Force, but its only client is the Air Force. Therefore, its affiliation with the Air Force is dependent upon a finely tuned working relationship with both the Chief of the Air Staff and the Deputy Commander Mission Support and Training (DComd Msn Sp and Trg)³⁴ within 1 Canadian Air Division.

As of 1 February 2006, the Air Force logisticians have many other higher headquarters to become familiar with especially regarding Force Employment based on new headquarters reorganizations as a result of CF Transformation. For example, the Commander of 1 Canadian Air Division (Comd 1 Cdn Air Div) now reports directly to the Commander of Canada Command (Comd Canada Com). However, while the Comd 1 Cdn Air Div still reports to the Chief of the Air Staff, in addition to the North American Aerospace Defence

32 The Canadian Air Division A4 Logistics (A4 Log) Directorate Mission Statement can be found at winnipeg.mil.ca/a4log/organization/aboutus_e.htm. Accessed 25 January 2007.

33 ADM (HR-Mil) is now known as Chief of Military Personnel.

34 DComd Msn Sp and Trg has recently been re-designated Deputy Commander Mission Support.

Command (NORAD) chain of command, the Comd 1 Cdn Air Div now has a new role in support of the new Canadian Expeditionary Force Command (CEFCOM), the Canadian Special Operations Force Command (CANSOFCOM) and the Canadian Operational Support Command (CANOSCOM).

At the operational level, most important to those working in the Air Force environment, is 1 Canadian Air Division, which is the home to logistics expertise found in A1 Personnel, A4 Logistics and the Division Comptroller. These organizations provide policy direction and/or an Air Force interpretation of policy originating from other headquarters, audit control, succession planning, force generation guidance, tasking coordination, and other operational support as required. 1 Cdn Air Div is also the link from the wing to the CAS, where force development and other strategic issues are addressed. In essence, this is the primary functional chain of command between Air Force logisticians at the wing level and the strategic level.

As well as having strategic and operational level headquarters within the Air Force, logisticians also have an operational chain of command directly from their Wing Commander through the Wing Logistics Officer, Wing Administration Officer or Wing Comptroller. In short, their mission is to achieve the W Comd's operational direction while respecting the functional direction they get from their respective 1 Cdn Air Div Directorate.

To the logistician, the key to success in this new environment is to develop specialized skills to support an Air Force role while still being able to adapt to a joint environment when attached to another command, such as CEFCOM for operations outside Canada (much like the old Deputy Chief of the Defence Staff organization). This can only be achieved by ensuring that the training system for logisticians remains essentially purple overall, with Air Force-specific training offered to round out an individual's training in order to operate within an Air environment, much as it is today. Success is also dependent upon the emerging Air Force Support Capability, which will eliminate the ad hoc approach that has been applied to Air Force support personnel deploying on CEFCOM type or Canada Com operations in the past. Under this model, logisticians will now train as they fight and deploy as a package in support of air operations. This model will also ensure that Air Force support personnel are interoperable with such national level assets as 3 Canadian Support Group (CSG), 4 Canadian Forces Movement Control Unit (4 CFMCU), the Joint Support Group (JSG), and others.

Integral support is provided to tactical units in varying degrees. This support allows a CO to deploy as a Tactical Self Sufficient Unit and can include as much as a complete flight of support such as a Tactical Helicopter Squadron that includes Sup Techs, MSE Ops, EME Techs, Cooks, RMS Clerks and Medical support. These units generally employ a Sqn Log O or Adm O to oversee the support activities. In some cases, the integral support is minimal but does allow some flexibility to the unit. When a unit is deployed, its support deploys with it allowing operations to proceed wherever they might be.

Organizational Structure – Static Employment – Main Operating Base. Logistics organizations working for the W Log O are Wing Supply (W Sup) and Wing Transportation and Electrical and Mechanical Engineering (W TEME). The W Log O MOB organization under the AFSC is shown below in Figure 7.6 so that it can be compared to the DOB organization in Figure 7.7.

Supply

Organization. The devolution of responsibilities to local levels during the 1990s resulted in a lack of standardization in supply organizations as each unit sought to mitigate the personnel and budget reductions in a manner that best suited their individual needs. Without central control, these supply organizations have diverged further from an organizational point of view. The following areas lack standardization amongst Air Force wing supply squadrons:

- a. Terminology (position and section names);
- b. Roles and responsibilities of sections (tasks differ within sections and subsections between wing supply sqns);
- c. Higher level organization (composition of HQ element, chain of command);
- d. Functional areas (i.e., Fuels & Lubricants management, Food Services);
- e. Integral support (some wings have integral supply sections within first line units, though two wing supply sqns remain that are responsible for all 2nd and 1st line supply functions even at the first line units); and
- f. Supply account management (i.e., in the case of Pack-up kits [PUKS], some wings hold these on Detachment accounts, other wings use warehouse accounts).

The Materiel Acquisition and Support Optimization Project (MASOP) and the AFSC have sought to address some of these issues, and 1 Cdn Air Div has undertaken to resolve the remaining ones. Some progress has been made on establishing a common organizational footprint, as well as agreement on supply chain functional areas within the logistics community; however, nothing has been finalized.

In general, although the terminology varies, W Sup Os are normally majors, and they report to the W Log O, in most cases a LCol. Within the supply organization, there will normally be a Material Control Flight, commanded by a Capt/Lt, which is responsible for supply operations, including aircraft spare management, warehouse and inventory management, receipts and issues, and repair and disposal, plus a Supply Customer Services Flight, commanded by a Capt/Lt and responsible for procurement, contracting, and customer services. As well, there will be a Supply Administration Officer (SAO), normally a CWO who is responsible for discipline, career management, stocktaking, performance measurements, and administration. At the smaller wings, the same structure exists but the rank levels are generally lower.

Organization of supply sections integral to units and squadrons varies based on the size and needs of the unit. In CF18 and Tactical Helicopter sqns, for instance, the section may be robust and include a Capt as the Sqn Logistics Officer and a Sgt responsible for the supply section. In other, smaller units, such as Combat Support Squadrons, there may only be one supply tech.

Operations. The identification of supply chain functions, those functional areas that should be the responsibility of the wing supply sqn, has been a recent and on-going undertaking. As mentioned earlier, supply functions are organized differently across the Air Force and trying to apply some standardization has involved a common understanding of what supply does, or should be doing. In general terms, the following are agreed to be supply chain activities that should be the responsibility of the wing supply sqns:

- a. Material management (includes all commodity types);
 - i. Warehouse management,
 - ii. Inventory management, and
 - iii. Material processing (Repair & Disposal);
- b. Material acquisition and procurement;
- c. Fuel and Lubricant management (fuel farms);
- d. Material traffic (issues and receipts processing [CMTT]); and
- e. Food services.

Efforts are in place to implement this functional model at all Air Force wings, but completion is at least one to two years away.

Food Services

Organization. Since the 1990s when the Food Service operation migrated from the Administration to the Logistics Branch, this concept has continued to evolve. Whereas the Food Services Officer (Food Svcs O) originally reported directly to the W Log O, the organization has now fine-tuned the W Log O's span of control on the wing. The Food Svcs O, normally a Capt now reports to the W Sup O instead the W Log O. The W Sup O has the opportunity to better mentor the young officer and assist with guidance in day-to-day issues. The opportunity for the Food Svcs O to become better oriented to general logistics with better career succession opportunities are seen as favourable to the Air Force Logistics and Food Services leadership. Opportunities for performing the role of acting W Sup O for short periods of time enhance Food Svcs Os' exposure to logistics as well as their credibility and competitiveness with their peers in the Logistics Branch. It should be noted however, that Food Svcs Os and Cooks are regarded as "purple" occupations and postings are not oriented toward the colour of the uniform. This has resulted in some postings where a member of the required rank and not necessarily the skill sets required has filled a particular position. For example, there are Cooks who have had most of their operational tours on ships and in the field. Their skill sets may not have been oriented toward administrative or civilian staff management environments. They may face huge challenges where training gaps have not satisfied the need for these skill sets.

Operations. In the Air Force, the primary role of the Food Service operation is to provide support to operations by issuing flight meals to all fleets and standby functions in accordance with CFAO 36-14. Diners who occupy quarters have the option of going on ration strength to consume their meals at the kitchen. Some sites that have contracted out a predominant portion of their support capabilities have subcontracted the food services functions (such as Moose Jaw). Though inconsistency exists, many wings have evolved to a combined feeding operation, catering to all ranks. Closure of Officers' Mess dining rooms have been influenced by Salary Wage Envelope (SWE) constraints and the staffing capabilities as a result of sending Cooks out during the early days of Operation APOLLO with no backfills. To cope with the task of maintaining catering services to the wings, many sites have hired civilian catering managers. They are capable of providing all of the catering services that members of the military community have become accustomed to receiving.

Transport/Electrical and Mechanical Engineering (TEME)

Organization. For the EME Branch there are no differences among the static, deployed, or expeditionary environments when employed in the air environment. The role of EME remains the same: inspect, repair and maintain all ground equipment in a timely manner. This function also includes recovery. A primary EME tenet is “Repair as Far Forward as Possible”—simply put, EME will perform any or all of these functions to suit the operational requirements and tempo of the mission. As shown in Figure 7.6, a typical EME workshop organization will include HQ and Control, Ancillary (Weapons, Material, Fire Control Systems), and Vehicle sections. Vehicle repair is often organized into sub-sections based on the nature of locally supported equipment—Heavy, Light, Militia Servicing, etc.

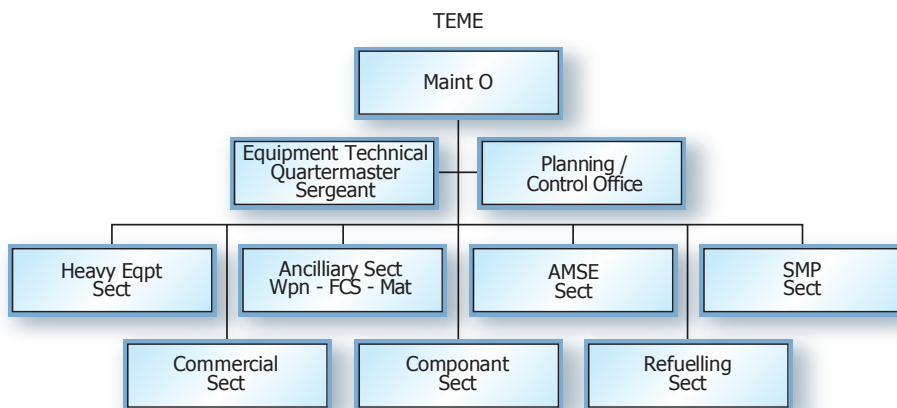


FIGURE 7.6. A TYPICAL TRANSPORT/ELECTRICAL AND MECHANICAL ENGINEERING ORGANIZATION

Beginning in the late 1990s, the EME branch assumed responsibility for the repair of Aircraft Maintenance Support Equipment. Overall, this transfer has been effected successfully.

At both MOBs and DOBs, the Mobile Support Equipment organization fits under Logistics (Wing Logistics Officer / Unit Logistics Officer). The Wing Transportation Officer (W Tn O / W TEME O) leads the organization and reports to the W Log O. The Tn/TEME Squadron is broken down in integral sections including MSE and, depending on variations at wings, Traffic and EME. The MSE Section is generally broken down into Special Purpose Vehicles (Heavy Equipment, and Refuelling), General Purpose Vehicles (personnel and freight transport) and an Administration Section (Fleet Management, Fleet Management System Data Entry, MSE Safety, Training, etc).

Operations. Within the Air Force, MSE fulfils three main roles:

- Operational Mobility – the assigned roles of certain units and formations demand mobility. Such units and formations are provided with integral MSE, both standard commercial (SC) and standard military pattern (SMP);
- Operational Support – MSE elements will be provided for the immediate support of operational squadrons engaged in operations or training. The MSE employed in this role may be SC or SMP, depending on the tasks assigned; and
- Administrative Support – MSE elements employed in the administrative support role will be equipped with SC MSE to the fullest extent possible. Normally, this

role will be a responsibility of MOB and may be defined as support for Air Force activities not directly connected with operations.

MSE Operators (MSE Ops) are identified as professional drivers/operators due to the diversity of vehicle types and equipment they operate, but also because of the level and extent of training they must undergo to obtain their driving and operating qualifications. As recognized professionals, MSE Ops must constantly display superior driving/operating skills. This is achieved by maintaining proficiency through a combination of experience, on job training, refresher training, remedial training, trade training, driver's education and specialized training.

Logistics officers (Air Transportation) are trained to manage and advise Commanding Officers on all aspects of MSE operations. In addition, they are also trained to perform the following:

- a. manage the MSE fleet;
- b. manage/lead wing transportation / transportation and mechanical engineer squadrons, generally including an air movements section; and
- c. perform any other Logistics occupation skills.

Air Movements

Organization. Within the Air Force, Air Movements is organized as follows:

- a. Air Movements (Air Mov) Section. Domestically, Air Mov Sects are generally organized along the lines of two to three shifts consisting of one MCpl and three to five Cpl/Ptes reporting to a WO (under a W Tn O of the Capt/Maj rank). Traditionally, Air Mov Sects will only deploy as small-formed groups (i.e., one MCpl and two-three Cpl/Ptes) in support of small wing aircraft deployments (i.e., 4 Wing Cold Lake personnel deploying to Forward Operating Locations [FOL] in support of CF18 NORAD deployments). Otherwise, Air Mov Sect personnel will deploy as augmentees in support of Mobile Air Movements Sections (MAMS) or CEFCOM (i.e., Task Force Mov Platoon) taskings.
- b. Materiel Distribution Centre (MDC). Domestically, MDCs are typically organized along the lines of two to three Cpl/Ptes under one MCpl reporting to a Sgt within the W Sup organization. Under the AFSC structure, MDC personnel will deploy as a small formed groups (e.g., one MCpl and one Cpl/Pte) within deployable Mission Support Units tasked to support MOB aircraft deployments. Otherwise, MDC personnel will deploy as augmentees in support of 1 Cdn Air Div or CEFCOM (i.e., Task Force Mov Platoon) taskings.
- c. Furniture and Effects (F&E) Section. Domestically, F&E Sections are organized with one to two Cpl/Ptes reporting to one MCpl/Sgt. Typically, F&E Section personnel do not deploy in support of 1 Cdn Air Div augmentee or CEFCOM taskings.
- d. Air Movement Squadrons (AMS). Domestically, AMSs are generally organized along the lines of Line Crew, Cargo Operations, Squadron Operations, Passenger Terminal Operations, Squadron Orderly Room and Squadron Training and Standards. The composition of these various sections is dependant upon Sqn size. Logistics officer (MOC 78D) employment is organized along the lines of a Sqn Commanding Officer (usually a Maj), Sqn Deputy CO / Operations Officer (usually a Capt) and three to four Capt/Lts (Line Officers, Passenger Terminal Officers, Cargo Operations Officer, Administration Officer). The traditional structure with

which Air Mov Sqn personnel deploy is as a MAMS Team, comprised of one Capt/Lt, one Sgt/WO, one MCpl and six to eight Cpl/Ptes. For planning purposes, there are currently a total of seven MAMS Teams within the Air Force. Air Mov Sqn personnel will also deploy as augmentees in support of 1 Cdn Air Div or CEFCCOM (i.e., Task Force Mov Platoon) taskings.

Operations. Air Movements sections perform the following operations:

- a. Air Mov Section provides domestic airlift support services including aircraft loading/unloading, load preparation, passenger embarkation/disembarkation procedures (including operation of the SABRE passenger booking system), and passenger and baggage security screening. Air Mov Sections also provide personnel to augment deployed MAMS personnel and perform airlift support services (as above).
- b. MDC (typically co-located with W Sup Receipts and Issues personnel) performs shipping, receiving and customs functions for the Air Force, including the operation of the National Material Distribution System (NMDS).
- c. F&E Section performs the Furniture and Effects function, including coordination and liaison with moving companies and quality assurance organizations.
- d. Air Mov Sqns performs domestic airlift support services at Canadian Aerial Ports of Embarkation/Disembarkation including aircraft loading/unloading, load preparation, cargo operations (including Customs and operation of the NMDS system), passenger embarkation/disembarkation procedures (including operation of the SABRE passenger booking system), Traffic Technician (Tfc Tech) and Air Movements (MOC 78D) training as well as passenger and baggage security screening. Air Mov Sqns provide MAMS personnel to perform deployed airlift support services including aircraft loading/unloading, load preparation, passenger embarkation/disembarkation procedures (including operation of the deployed SABRE passenger booking system), and operation of the deployed NMDS system, passenger and baggage security screening.

Air Logistics Officers fulfill the role of W Tn Os, who are in charge of Air Mov Sections. In many cases, W Tn Os provide the wing and W Log O with general movements (production of Unit Movement Staff Tables, Task Force Movement Tables, CF Movements System knowledge) and Air Movements (airlift support services) advice.

Air Logistics Officers also fulfill the role of Air Movements Squadron COs and MAMS Officers, providing domestic and deployed leadership of MAMS Teams. Both COs and MAMSOs provide the wing with general movements (production of Unit Movement Staff Tables, Task Force Movement Tables, CF Movements System knowledge) and Air Movements (airlift support services) support.

Human Resources (HR)

Organization. The HR officer community is composed of personnel from a wide spectrum of diversified backgrounds based on their previous employment, which has been predominately from: Occupational Transfers/Reclassifications, Commissioned From the Ranks, University Training Plan NCM / Regular Officer Training Plan and Direct Entry Officers. As the “old guard” gradually retires, newly trained Logistics HR officers will mature in a more operational and expeditionary CF environment. Should the “new generation” HR officers continue to suffer from a lack of targeted core competencies, specific academic backgrounds, focused employment and salient professional/leadership

development opportunities, the community will continue to meet with significant barriers in garnering credibility in the operational context.

At the junior officer level (Lts and first tour Cpts), the role of the HR officer is more of a military administration/personnel management or services “generalist” rather than specializing in any core HR capability. Upon completion of the common Logistics phase training, HR officers receive further training in the HR discipline through the “Human Resource Management” course at CFSAL which trains officers to research, advise and staff military resource management issues at the base/wing, formation and NDHQ level. Assignments for qualified logistics officers with the HR discipline qualification range from Squadron Administration Officers to Deputy Personnel Administration or Services Officers at a wing or junior staff level in a deployed setting.

At the intermediate rank level (senior Capt to second tour Maj), middle management activities such as overseeing/mentoring and coaching junior HR officers, analyzing policy, overseeing/managing Personnel Support Program and Messes, managing complex HR activities such as vacancy management / succession planning and prioritizing resources are normal expectations. These middle management activities are normally carried out at the wing or operational/national level HQ or in rarely-seen senior leadership/staff appointments in a deployed setting. Specializing in core HR capabilities (or achievement of Certified Human Resources Professional [CHRP] Certification) is based on personal initiative to obtain postgraduate, professional development or specialty training provided by civilian organizations. Formal military training for HR officers is restricted to the potential to obtain qualifications in other Logistics disciplines (e.g., Fin, Tn or Sup) or attendance and professional development on the AFOBC.

At the senior level (Maj—LCol), HR officers are seen as senior HR process advisors (responsible for HR planning and analysis, reviewing effects of HR/labour legislation, etc) or as able to fill command positions, although this is rare, at the wing/unit level or in other corporate support roles such as Director General Compensation and Benefits, Director General Military Careers, Director General Canadian Forces Grievance Authority or in certain senior instructional positions (e.g., at CFC). Opportunities to function in a joint capacity, domestically or internationally, are rare although some senior HR officers have been assigned positions in joint planning staff outside of their primary HR specialization. As for the intermediate level, specializing in any core HR capabilities (or achievement of Certified Human Resources Professional) is further enhanced at this level for those who have maintained personal interest, focus and initiative. Formal military PD training at this level is normally through attendance on the Advanced Logistics Officer Course (ALOC), the Advanced Aerospace Operations Course (AAOC) and the Command and Staff Course (CSC).

Finance

Organization. Historically, Comptrollers report directly to the W Comd or the Division Comd. The relationship is essential for the delivery of unbiased and ethical financial advice. That same relationship exists in a theatre of operations on deployed or expeditionary operations, and is also depicted in the MSS concept. Indeed, financial personnel must retain objectivity throughout their services, and direct access to the Commander is required to ensure that their advice is heard.

Finance personnel are employed in a squadron generally as A1. This is usually in Development Period 1 (2Lt/Lt) where they are exposed to tactical level imperatives. At

this stage they are expected to provide support for the entire Fin/Admin spectrum, and the W Compt supports them functionally. Other 2Lt/Lts may also start their training as Public Fund Accounting Officers (PFAO); in this tenure they will be exposed to Pay, Claims and Cashier operations, and they are in the W Admin O chain of command. This employment opportunity is critical to the operation as it mirrors deployment finance personnel knowledge requirements.

The MOB roles are similar at the wing and division levels. They consist of business planning, review services, costing services, audit and financial advice. Other domains of expertise are organization and establishment management, training to resource managers, Service Level Agreements / Memoranda of Understanding management, budget monitoring, performance management, Financial Management and Accounting System (FMAS), accrual accounting and credit cards management.

To ensure adequate variety of experience to enable a proper force generation capability, the W Admin O Finance personnel should be annually exchanged with WCompt's personnel. Unfortunately, this requirement is often difficult to achieve considering shortages of staff. As a result, RMS Clerks with a Finance specialty have become scarce resources. At the Division level, RMS Clerks are employed in the management of Hospitality Requests, Write-Off Consolidation and Command Comptroller Inspections. Officers at this level are expected to manage resources for 13 wings and previous W Compt employment is required.

Operations. The Logistic sub-classification Finance went through tremendous change over the last 10 years. Its main function—pure accounting—evolved into other areas, as described above, and the result was a more forward-looking organization. The new vision aimed first at satisfying the new Financial Administration Act with respect to modernized comptrollership with the introduction of the Five Pillars of Comptrollership enacted in the mid-1990s.

These Five Pillars are: (1) ensure the financial implications of decisions are understood before decisions are taken; (2) properly manage financial risk; (3) properly track and account for financial transactions, and assess and report results of all financial transactions; (4) protect against fraud, financial negligence, violation of financial principles and rules, and loss or misuse of assets; and (5) encourage and utilise the Comptrollers objective's commentary, independent advice and exercise of the challenge function.

The Pillars, applicable to all resource managers, reflected and supported the new departmental policy on the devolution of operating budgets. This devolution, accompanied with an increased tolerance level to risk management, gave decision makers the flexibility to manage their entire resource envelope. Recent Transformation efforts at the 1 Cdn Air Div level did not impact on the Comptroller's organizations; however, the newly established CF commands have employed more Finance Officers, leaving a bigger gap in force generation and force employment capabilities.

Organizational Structure – Deployed – Expeditionary. All logistics personnel are subject to be deployed to support air expeditionary units throughout the world. From a logistics perspective, the Air Force has not done this deployment function well, and the large number of deployments over the last few years has taken a toll not only on logistics personnel but also on the support that they have been able to provide to both the MOBs and deployed locations. Logisticians who have participated in deployed operations had traditionally been selected on an ad-hoc basis, and, therefore some wings may have been tasked to provide personnel more often than others. The recognition of this has led to

the evolution of the Air Force Support Capability that is designed to generate formed, responsive expeditionary support for Air Force contingencies.

Unfortunately, AFSC will not address all deficiencies with the current way the Logistics community deploys resources to support CF operations. Ideally, the support would be embedded within permanently formed AEU's that train and operate together in Canada. However, this is beyond our current means. As directed by the CAS, the AFSC compromise is to maintain at least the integrity of the Mission Support Squadron, train with AEU's as often as possible and then add on the fleet specific pieces as required. Since this is a force generation model, it represents the most likely requirement; however, the reality is that the community will continue to have to react to needs of force employment and deploy resources as required, sometimes in ones and twos and sometimes in sections or flights to realize General Support (GS) or other CF support requirements. The AFSC will go a long way to improve the way the community deploys, but the nature of deployed operations requires the community to be as prepared as possible (based on our notional plans), and then react the best way possible based on the circumstances. When this was written, the first Mission Support Unit was being prepared to deploy to Camp Mirage in June 2006.

Air Force Support Capability from a Logistics Perspective. At its core, the AFSC re-aligns the Air Force support structure from its current organization to a new structure that provides the CF Air Component Commander (ACC) with identifiable, task-tailored, and globally deployable combat-capable MSUs that can rapidly respond to tasks at home and abroad, in joint, combined or inter-agency operations. The capability relies on existing command and control at the wing but follows a new managed readiness and training support cycle, with 1 Cdn Air Div DComd Msn Sp providing oversight.

For routine operations, the MSU will provide support to the MOB using available personnel not conducting training for deployments, deployed or on trades/qualifications training as part of their individual training and skills retention activities. Service levels, performance measures and issues resolution are to be clearly defined to ensure continuous MOB support.

The AFSC will establish MSUs for the force generation of close support to AEU's in order to support CF domestic and international operations. MSU managed readiness and continued skills retention activity at the MOB will enhance focus on training and enable the CF ACC to meet their force generation requirements to Canada COM and CEFCON. Due to the trade skills development and skills retention opportunities afforded at the MOB's, domestic and integral support functions should remain under the command of the WComd to facilitate maximum operational flexibility in generating a force package from wing support resources.

MSUs will be the primary force generators of standing tasks such as OP CALUMET and CFS Alert as well incremental taskings. All wings however are liable for these tasks and will participate through close coordination by functional subject matter experts, whether an MSU is in location or not. Regardless of the force generation model employed, requirements will, from time to time, fall outside the parameters used in deliberate planning; therefore, a certain amount of ad hoc planning is to be expected.

To respond to Canada COM and CEFCON contingency operations, MSUs will generate MSSs that consist of an MSS HQ and task-tailored elements from functional Flts in Log, AE, CIS and HR/Fin to meet mission requirements. The MSSs will deploy with the requisite vehicles and equipment for their assigned AEU or General Support Force (GSF).

It is planned that the AFSC will be implemented in the following spirals:

- a. Spiral One “In Place Forces”: stand-up and managed readiness of six MSU flights ahead of signature of the Master Implementation Plan to provide sustained support of Camp Mirage (which requires five MSU Flts) and a surge capability to support one DOB (or equivalent task) for a six month period (unsustained);
- b. Spiral Two “Balanced Forces”: after signature of the MIP re-balancing of resources will be initiated which will generate four additional flights (i.e., positions and SWE allocations) and inject funds for the procurement of new equipment (CAS Non-Strategic Capital Project); and
- c. Spiral Three “Robust Forces”: further investments will be made to create two additional MSU flights to bring total to 12. This goes beyond the current project MIP.

Unfortunately there are not sufficient support personnel and resources to generate and sustain formed expeditionary support capabilities dedicated to each operational community; therefore the CAS directed those planning the AFSC to develop a generic support capability that could be employed to support any of the fleets. Where Integral Support capabilities exist within the operational squadrons, i.e., Fighters and Tactical Aviation, those are deployed with the MSS and folded within one C² structure once deployed to ensure economy of effort and unity of C². This also allows for specialized support (e.g., aircraft spare parts) to be deployed and provides the fleet-specific knowledge and experience. It was recently decided that Log Os from operational squadrons would also be embedded within the MSS force structure as the Deputy CO / Operations Officer. This officer will facilitate liaison between the MSS and the TSSU, especially when they come from different communities and have potentially different experience and cultural backgrounds.

The MSU structures for MOB and DOBs are shown in Figures 7.7 and 7.8 respectively.

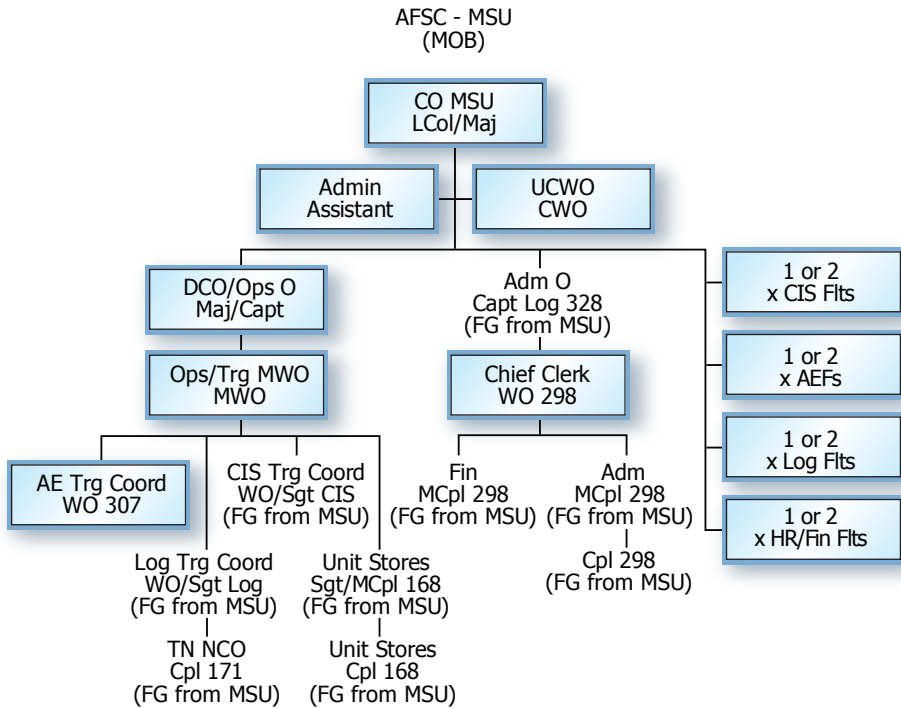


FIGURE 7.7. MSU STRUCTURE FOR A MAIN OPERATING BASE

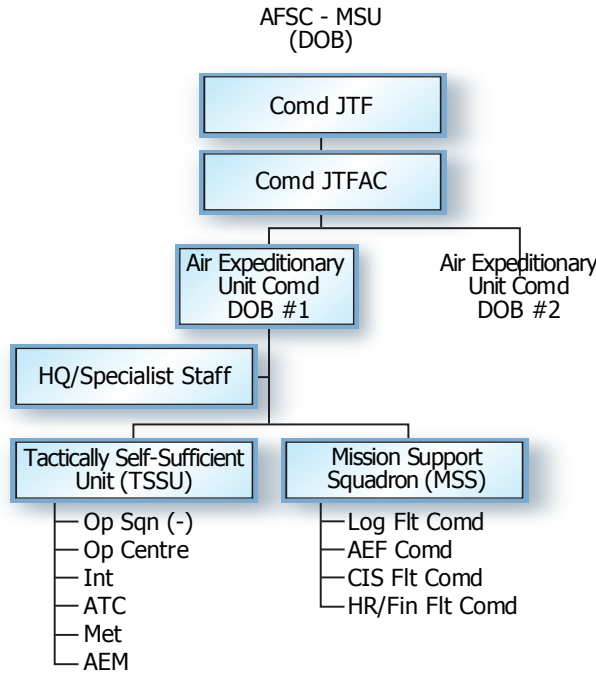


FIGURE 7.8. MSU STRUCTURE FOR A DEPLOYED OPERATING BASE

In addition to the formed units envisioned by the AFSC, each of the logistics disciplines also may be ad hoc additions to other elements of a deployed operation. Some specific examples follow.

Supply

Supply personnel are employed at all levels and ranks in a deployment, from integral support in a TSSU to close support roles in the National Support Element (NSE). Given that the supply trade is truly “purple,” there is a high degree of “jointness” within the community. Air Force supply organizations can integrate well into Army support organizations during deployments, for example with tactical helicopter squadrons.

Foods Services

The evolution of the AFSC concept has addressed the ad hoc nature of taskings across the Air Force, from a Food Services perspective. Each MSU has been designated to provide a set number of cooks to deploy and support CEFCON and Canada COM taskings in their planned readiness cycle. While these cooks deploy, it is anticipated that SWE backfill funding will become available to maintain the Food Service support function at the MOB for the duration of the MSS’s absence because support to flight meals and in-house feeding must continue, as regular operations on the wing will continue. To cope with the task of maintaining catering services to the wings, many sites have hired civilian catering managers. They are capable of providing all of the catering services that members of the military community have become accustomed to. The success of this concept will be evaluated commencing in the summer 2006 with 17 Wing’s deployment to Camp Mirage. Typically when the Air Force has deployed in the past, the supporting base would be located in a safe area where the Food Services operation would resemble a domestic food service wing with relatively low vulnerability to risk. To date, the Air Force has not yet had to set up a tactical

feeding facility with the exception of the Tac Hel Sqns that would resemble an army field feeding operation. After the first AFSC deployment, the capability of the remaining unit will also be assessed.

TEME

At a DOB, the size of the MSE Section and its scope of responsibility depend on the nature of the mission, the size of the Task Force, the location of the deployment and its expected duration. The General Purpose Vehicles sub-section is generally required on most deployments, while the Special Purpose Vehicles requirement depends on the Host Nation Support available and environmental issues (e.g., refuelling, airfield maintenance, snow and ice control, construction engineering, etc). The MSE organization is fully employable without re-organization in a joint and/or multi-national environment.

For the EME Branch there are no differences between the static and deployed roles or the expeditionary environment when employed in the air environment. The role of EME remains the same—to inspect, repair and maintain all ground equipment in a timely manner. This function also includes recovery. A primary EME tenet is “Repair as Far Forward as Possible”—simply put, EME will perform any or all of these function to suit the operational requirements and tempo of the mission.

Movements

In general, Tfc Tech and Air Logistics Officers will perform similar functions and roles both when employed in a domestic setting in support of 1 Cdn Air Div / CANR and when deployed in support of the Air Component Commander under a Joint Task Force Commander. Simply put, domestic operations mirror our deployed operations. When Tfc Techs and Logistics Officers are deployed outside of the Air Force / Air Component structure, they will be employed within their professional and technical areas of expertise, although their positions will be generally dissimilar to their domestic ones. Air Force logisticians will provide MAMS personnel to perform deployed airlift support services including aircraft loading/unloading, load preparation, passenger embarkation/disembarkation procedures (including operation of the deployed SABRE passenger booking system), and operation of the deployed NMDS system, passenger and baggage security screening.

Human Resources

There is little demand for the HR officer in deployed operations due to the specialized nature of HR services and a lack of employability outside of the MOB context. Though considered within the same structure as Tn, Sup and Fin, HR has little visibility or equivalency in the deployed operational context where HR process ownership is normally assigned to the command level. HR support to deployed operations is normally limited to RMS Clerks at the NCM level who are subject to be deployed at all levels from the tactical unit to the higher headquarters.

Finance

The Finance Officer exists as a military occupation because they are required for deployments. Many studies have suggested converting Finance Officers positions into civilian positions without success for that reason. Because of the devolution of budgets, the Operational Commander, in a deployment, maintains full accountability of their financial decisions. This accountability function can only be effectively discharged in a theatre of

operations with the advice provided by military finance personnel who also are employed as RMS Clerks or officers in the various levels of units and headquarters.

Description of the Role of Reserves in the Logistics Community. The Air Reserves play an integral and vital role within the Air Logistics community. Typically, Reserve members receive the same level of training as their Regular Force counterparts, and thus they can be employed in most positions without difficulty. Additionally, Air Reserve personnel have increasingly been tasked to fulfill training roles as incremental staff on officer classification and NCM trade courses. As with other Reserve classifications and trades, many ARAF logisticians are recently retired Regular Force members. However, it should be noted that representation of EME officers and NCMs in ARAFs is extremely rare, as these personnel will usually be found in local Militia organizations.

Air Reserve officers and NCMs have successfully and seamlessly been employed on international operations either as primary candidates or to satisfy a tasking that could not be met due to manpower shortfalls. There is an ever-increasing demand for their use, especially at the Cpl/MCpl level. Unfortunately, this demand cannot be currently met due to lack of available personnel, restrictions on funding and limitations on the creation of Reserve positions. The AFSC aims to integrate Class A Reserve positions into the MSUs upon completion of the Air Reserve Re-alignment Study in 2006.

Factors that Affect Culture and Leadership in the Logistics Community.

Culture

Air Force logisticians are an invaluable component of the Air Force Team. Without them, materiel would not be available for operations, there would be no movement or transportation of material and personnel, no financial framework to operate within, no provision of food services and no mechanisms in place to address the myriad of issues originating from our most valuable resource, the people.

All logisticians, no matter what colour of uniform worn or rank held, are trained to work in combined, joint or single environmental units, as well as strategic, operational or tactical headquarters and are truly considered a “purple” branch of the CF. It is not uncommon for a logistician to serve in any number of different component commands during their careers.

Once assigned an Air Force uniform, however, a Logistics officer will normally spend the bulk of their time in the CF with the Air Force or representing that affiliation in a joint or combined unit. Therefore, it is essential that the Air logistician fully understand air operations and the necessity to ensure unhindered support to the Main Operating Bases, Deployed Operating Bases or even more austere Forward Operating Locations both in stand-alone air or combined or joint operations, because working from each of these locations presents different challenges for the Air logistician.

Also employed in the logistics field in the Air Force are many members of the EME Branch who, although comprised entirely of an Army classification and trades, provide essential support to air operations. 1 Canadian Air Division conducts the EME Support to Air Operations Course in order to ensure senior EME personnel who have not previously been employed in an air unit are familiar with the differences in the conduct of operations and equipment between the two environments.

During DP 1, specific Air Force training is provided for officers on the Phase II Air Environmental Course and on Phase IV on the Logistics Officer—Air Course. The first portion of this training introduces the junior officer to the history of the Air Force, concepts of air power, organization, equipment and operations of air forces. Phase IV concentrates on providing the knowledge and skills to Air Logistics Officers for their first operational employment in an air unit. Graduates of this course would ideally be posted to an entry-level position at a wing to gain experience in the MOB concept. It is here that junior officers will build on their environmental training to acquire a detailed understanding of the unique aspects of providing wing-level support to air operations.

The Air Force Officers Basic and Air Force Officers Advanced (AFOAC) courses are available for the further professional development of Air Force officers. The AFOBC introduces junior Air Force officers to the history, evolution, culture, and doctrine of the Canadian Air Force and further examines the fundamental principles associated with planning and sustaining aerospace operations. The AFOAC develops and refines the skills of new majors in the planning, execution, and sustainment of aerospace operations at the operational level of war, preparing them for future employment in progressively more challenging positions involving the implementation of air force operations. Logistics Air officers and EME officers employed with the Air Force attend both of these courses as part of the air force team.

For NCMs, the Basic Air Environmental Qualification is gained by attending a course run by the Air Force Academy at Borden that is designed to allow a new recruit or a person undergoing an occupational transfer to the Air Force the opportunity to become acquainted with the Air Force in a more comprehensive fashion. Although it is designed for all Air Force trades to attend, not every Air logistician, especially at the senior NCM level has had this opportunity.

The Logistics NCM in an Air Force uniform may spend a significant part of their employment in other environments, and, therefore must be very adaptable. Most logistics training for non-commissioned personnel is geared towards operations in any milieu. It is extremely important, however, that when employed with the Air Force that a thorough understanding of operations is ingrained in them. To date, the Logistics Branch has not done this well. Non-commissioned personnel in the Logistics Branch receive no specific training in air force operations and generally have very little knowledge outside of their own sphere of employment. A recent Advanced Logistics Officers Course (ALOC) had four candidates of MWO and CWO rank attend the course for the first time. Although this course does not deal exclusively with air operations, feedback from those attending was that the overall training and content of the course and the wide range of logistics operations it presented opened their eyes to the extent of the logistics involvement in any operation.

Leadership

Leadership is an essential quality of any officer or NCM in the CF. However, for junior Logistics Air officers, leadership is a critical requirement very early in a career as they are often first employed in positions with a large staff, a significant budget and responsibility for extensive equipment and materiel. Unlike other occupations, where first employment may hold fewer responsibilities, the logistician is required to master these skills very early. Additionally, the wide range of employment for the Air logistician in deployed, MOB and staff positions throughout the CF necessitates a large degree of job knowledge as well as

well-developed leadership abilities that can be effectively transferred from one type of employment to another.

Leadership is stressed for all officers on Phase I training on the Basic Officer Training Course (BOTC) Parts I and II. However, for Air logisticians, leadership skills are further developed during Phase III training on the Logistics Officer Course Common (LOCC) and the Phase IV Logistics Officer Air Course. Generally speaking, this is the extent of the formal leadership training received by Logistics officers (although some time is spent on Leadership during the AFOBC and AFOAC) until certain officers are selected as majors or lieutenant-colonels for the Command and Staff Course. Nevertheless, throughout their careers Logistics officers are expected to hone and expand their leadership abilities.

EME Officers are similar to Logistics officers in that very early in their careers they are employed in positions requiring crucial leadership skills. Like all CF officers, EME officers receive leadership training during BOTC, and they get more such training during the Common Army Phase training, as well as Phase III and IV EME training. Leadership skills are further developed during the Army Tactical Operations Course - Combat Service Support (ATOC – CSS) as well as the Army Operations Course held at the Canadian Land Forces Command and Staff College.

NCMs are also expected to possess effective leadership skills to be successfully employed in the myriad of duties expected of them. Much of the NCM leadership training is not specific to logisticians or EME technicians, but is provided throughout the career of the NCM by both the Non-commissioned Member Professional Development Center and the Air Force Academy. This training is required at specific periods throughout the development and progression of the NCM in the CF. Unique to all Air Force NCMs is the Senior Air Supervisors Course, and the Sergeant's Seminar specific to Air Force senior NCMs. Both are designed to augment the leadership knowledge and skills gained during CF common training. These courses are now being replaced by standard CF courses.

Air Force logisticians are proud members of Canada's Air Force, and are committed to providing the best logistics support possible and the utmost leadership to provide these essential services. They belong to the largest Branch in the CF and as such may be required to serve in any environment. It is this distinctive combination that allows logisticians to fully integrate into any operational environment with relative ease and to provide the leadership necessary to meet any challenge head-on.

Who is considered to be in the Air Force in the Logistics Community? All logisticians wearing an Air Force uniform are considered part of the Air Force community. Besides those wearing light blue, however, any logistics or EME personnel not wearing the uniform but working for the Air Force at any level are also considered part of the team. The logistics community is diverse and touches all aspects of Air Force operations, from providing integral support at squadron level to the highest levels of strategic headquarters. Therefore, the community reaches all areas of operations and support.

Conclusion and Summary of Main Issues. Air logisticians serve in every location the Air Force operates in and consider themselves full members of the Air Force team. The one area that has caused concern in recent years has been the operational tempo and the lack of personnel to effectively provide the best service to MOBs and deployed operations at the same time. It is hoped that the AFSC provides the means to effectively manage the readiness of the Air Force support personnel and enables logisticians to provide service that is truly "Second to None."

Long Range Patrol Aircraft³⁵

Introduction. Canada's Long Range Patrol Aircraft (LRPA) capability was significantly improved in the early 1980s with the purchase of 18 Lockheed-designed Aurora aircraft which were purchased as replacements for the aging Argus fleet. The new aircraft provided a greater capability than its predecessor and gave the CF an answer to the submarine threat of the era.

During this Cold War period, the Aurora fulfilled the same anti-submarine role as the Argus and the Neptune had done previously. Crews were constantly challenged and motivated as they routinely flew against real-time targets because the ongoing location and tracking of Soviet submarines was seen as critical to NATO's safety. In conjunction with its ASW role, the Aurora also maintained a recognized maritime picture (RMP) of foreign naval vessels operating in the Atlantic.

With the end of the Cold War the requirement to replace or update the Aurora took a back seat to other national priorities and the aircraft slowly declined in capability. During the 1990s the LRPA force continued to practice ASW skills against a greatly reduced submarine threat in the North Atlantic. Deploying in 1993 in support of the UN's involvement in the former Yugoslavia, the Aurora was tasked to maintain an RMP while providing an ASW capability against the local ASW threat. This mission marked the last deployment where live war-shot torpedoes were carried in response to an ASW threat.

The operational tempo of the LRPA force continued to slow throughout the 1990s, a result of reduced authorized flying rates and serviceable aircraft. While the community continued to train for the traditional ASW mission, the reduction in submarines to train against resulted in a further degradation of ASW skills.

As a result of primary flight instrument malfunctions in the late 1990s, low altitude operations at night or in instrument conditions were prohibited. Additionally, a decision to stop training with live torpedoes as the result of a near crash of an armed aircraft at a civilian airfield again caused a decline in capabilities. Only after 9/11 was the impact of these decisions fully realized as aircrew tried to regain proficiency in these disciplines, in preparation for OP APOLLO. With an exceptionally limited pool of personnel experienced in low altitude flying and in carrying live weapons, the slow rebuild of this skill set continues today. As part of the US-led Campaign Against Terrorism, a Long Range Patrol (LRP) Detachment was deployed into theatre with the advance party arriving in December 2001 until operations ceased in June of 2003. Throughout the operation, the LRP was tasked with maintaining an RMP. The continued lack of ASW tasking during this period continued to atrophy crewmembers' ASW capabilities resulting in meager workloads and reduced motivational levels for some crewmembers. To compound this effect ASW weapons were not even deployed for the operation.

In 2004, the LRPA community participated in OP SIRIUS, Canada's contribution to the NATO mission known as OP ACTIVE ENDEAVOUR. The LRPA operated as part of the Standing NATO Response Force Maritime Group 1 in support of its mission to deter, monitor and intercept potential terrorists in the Mediterranean Sea, to defend NATO member nations against terrorists operating at sea, and to demonstrate resolve and presence in the campaign against terrorism. Again this mission involved the compilation of an RMP with no ASW operations.

³⁵ This section was written by Maj Rick Searle Counter Surface Operations Sea 2, Canadian Forces Aerospace Warfare Centre, 8 Wing Trenton; and LCol Doug Moulton Counter Surface Operations Sea, CFAWC.

As a result of the recent release of a new Defence Policy Statement and the ongoing change within the Canadian Forces to remain relevant, responsive and effective, the LRPA community is conducting research aimed at supporting the Army in overland operations with the introduction of a more capable electro-optical/infra-red (EO/IR) sensor. However, before this capability can become operational, many challenges need to be addressed. These include the lack of a self-defence suite on the Aurora, the requirements to integrate the EO/IR sensor, and the need to improve situational awareness for key crewmembers. Regardless of the outcome of these initiatives, it is apparent that change will continue to impact on operations within the LRP community.

Community Jobs or Roles. The LRPA community is involved in expeditionary, deployed and static environments. Given the general characteristics of the LRPA, it is ideally suited for those operations requiring range and endurance. Initially designed as an ASW platform to support naval operations and regularly used in support of other government departments (OGDs) such as Fisheries and the Coast Guard in the maintenance of Canadian sovereignty, the evolution of threats to Canada has forced the LRPA community to investigate new roles never imagined by the aircraft's designers. Most recently, the introduction of the Aurora as an overland ISR platform is being pursued in order to meet the immediate operational requirements in Afghanistan and future requirements associated with the Standing Contingency Task Force (SCTF). As is apparent by these new roles, the employment of the Aurora, in expeditionary and deployed operations, is being molded to meet new Canadian needs. Given the limited resources available to the Canadian Forces, it is anticipated that this approach of deriving new capabilities out of existing weapons systems will continue in order to meet national needs. From static locations, the LRPA roles remain largely unchanged. The community continues to conduct its domestic operations as it has since the introduction of the Aurora, only with improved onboard sensors.

Organizational Structure – Static Employment – Main Operating Base. From a static perspective, the LRPA community operates from two wings: 19 Wing on the west coast and 14 Wing on the east coast. The west coast operation is home to 407 Squadron and 19 AMS. The east coast is home to 405 Squadron, 404 Squadron and 14 AMS. Interestingly, the construct of the static organizations on both coasts are unique, with the west coast operating in a squadron maintenance format while the east coast operates with 14 AMS as the central agency responsible for all Aurora maintenance.

Organizational Structure – Deployed – Expeditionary. Deployed operations are conducted at the crew level, with aircraft maintenance performed by qualified crewmembers. Mission essential spares are deployed (when available) along with the appropriate technicians to assist with specialized maintenance required to support these systems. This provides a limited redundancy and is dependant on availability of spares and the importance of the deployed operation.

Expeditionary operations are generally conducted in the form of LRP Detachments (LRP Dets). OP APOLLO is a prime example of this approach as two Aurora aircraft deployed to the Middle East in December 2001, with approx 200 Air Force personnel, including flight crews and support personnel. The mission of the LRP Det was to deliver reconnaissance and surveillance support to the maritime coalition forces. Although the operation was considered a success in all respects, it must be noted that the construct of the LRP Det from various Aurora units from across the country challenges the concept of train as you fight. This inconsistency in the approach to operations should be cause for concern.

Relationship of the LRPA Community with other Communities. There are several important relationships that exist between the LRPA community and those they operate with on a regular basis. Often operating in support of naval operations, the LRPA community has developed a strong professional relationship with the Canadian Navy. The coordinated surface and subsurface operations conducted by these two communities has resulted in both communities developing a respect for the capabilities that each brings to the fight. This relationship also extends to the Maritime Helicopter community, as all three communities work in a coordinated fashion to exploit the inherent capabilities of each weapon system in the conduct of subsurface warfare. Most recently, the LRPA and MH communities operated together in the Arabian Sea in support of OP APOLLO. The Aurora aircrew conducted surface surveillance missions and called on Sea Kings to conduct close-up investigations of vessels of interest, a task better suited to the capabilities of rotary wing aircraft. This marriage of air assets ensured the most appropriate use of limited theatre resources.

Another important relationship to the LRPA community is that which has been forged with the LRPA communities of our closest allies. The annual Fincastle Competition among Commonwealth air forces in anti-submarine warfare activities is representative of the importance that the LRPA community assigns to this relationship. The competition to represent Canada at the annual event is often fierce as it provides an opportunity for the selected team to demonstrate their professional competencies amongst their peers. Canada did not participate in the last Fincastle due to limited aircraft availability.

The most recent relationship to begin to develop has been that with the Canadian Army. Because of the Army's need for additional ISR platforms in support of its operations in Afghanistan and other areas of the world, the LRPA community is moving forward with the development of an over land capability to support the Army's need. This task will undoubtedly add to the Aurora's relevance within the government's Defence Policy Statement (DPS).

Although OGD taskings are considered secondary taskings for the LRPA community, the relationship with other OGDs is important as it supports the government's domestic security needs with a highly capable platform that provides these departments with valuable support that they could not otherwise afford on their own. Support to OGDs includes fisheries, pollution, immigration, and counter-drug patrols and they are defined through MOUs identifying the LRPA resources available to these agencies on an annual basis.

Description of the Role of Reserves in the LRPA Community. The Reserves play an important role within the LRPA community. They are primarily employed as individuals within operational, training, maintenance and test and evaluation units. These individuals offer a wealth of experience to both wings. However, as a result of reduced flying rates and poor aircraft serviceability, Reservist aircrew have difficulty in maintaining proficiency as compared to Regular Force aircrew. This has resulted in the majority of Reserve aircrew being employed in non-flying positions. The exception to this practice has been the Reserve Flight Engineers as their currency requirements are not as constraining as for other crewmembers. Reservist maintainers continue to support LRPA operations in a consistent and professional manner as their employability is not affected by aircraft serviceability. It is expected that Reservists will continue to be an important element in the ongoing operations of the LRPA community.

Factors that Affect Culture and Leadership in the LRPA Community. Within the LRPA community a leader must be able to guide their crew throughout the complete range of Aurora missions. Without this operational ability a leader's credibility is seriously weakened. The

crew of an Aurora is made up of at least 10 crewmembers including pilots, navigators, flight engineers, and airborne electronic sensor operators (AES Ops). The mission commander or Maritime Patrol Crew Commander (MPCC) is either a pilot or navigator.

Command success for MPCCs is predicated on their capability in two areas. First, the MPCC must demonstrate a command of their primary job within the crew. This is the foundation on which the crew will base its trust. Second, the MPCC must have the required leadership skills and abilities to manage egos and personalities during often-complicated missions. The traditional lead role for pilots and navigators are aircraft captain and tactical navigator (TacNav) respectively. Despite the different streams that lead to these two positions, both navigators and pilots have been successful in exercising their leadership responsibilities within the crew environment.

As a direct result of reduced flying rates, the normal progression of navigators from Navigator Communications (NavCom) and Acoustic Sensor Operator (ASO) to TacNav has been compromised. This has led to navigators without experience in all of these positions being assigned as MPCC and has resulted in a less than ideal command structure.

Additionally, the lack of flying hours has required that aircrew be managed in a tiered readiness posture. This results in crews being constantly juggled to maintain their designated readiness, while the continuity in the make up of crews and their effectiveness are sacrificed. This impacts equally on both pilots and navigators and in the long run will stifle the crew cohesion necessary in order to function in the high intensity operations commonly seen within the LRPA community.

Who is considered to be in the Air Force in the LRPA Community? Within the LRPA community all personnel wearing light blue are considered to be in the Air Force. While this is the general feeling within the community, there are discrepancies in the working relationships that exist between aircrew and technicians while operating from static locations resulting from organizational constructs. These challenges seem to evaporate during expeditionary operations where they experience a real sense of mission accomplishment. This situation can be explained by the change in organizational structure that occurs as one moves back and forth from static to expeditionary operations.

Conclusion and Summary of Main Issues. The effects of reduced flying rates, the lack of a well defined mission and an aging aircraft on the LRPA community should not be underestimated. As the Aurora is currently undergoing a piecemeal modernization process, the current flying rate, which is insufficient for the maintenance of appropriate qualifications, can be expected to continue to decrease. This situation will continue to present the current LRPA leadership with challenges that must be met head on if the community is to emerge intact and functional.

The general result of the current situation is a decrease in morale amongst aircrew as they are expected to conduct today's operations while preparing for the new roles of the future without the resources necessary to succeed. As the current upgrade project continues to suffer from technical difficulties and numerous schedule delays, it is becoming more difficult to see a way ahead and a future resolution for the community's problems. This situation often leads to personnel seeking other opportunities because they feel they are not provided with the tools necessary to accomplish the mission.

The recent force structure changes necessary to stand-up the Canadian Forces Aerospace Warfare Center (CFAWC) have impacted on command opportunities within the LRPA

community. While no one argues the necessity of creating the CFAWC, the decision to close 415 Sqn in the summer of 2005 has added to the current struggle for the limited command positions within the community. Given the differing professional development streams within the LRPA pilot and navigator MOCs, there is a real feeling that a struggle for control of the few command positions is occurring amongst pilots and navigators. This situation is also aggravated by the current health of the pilot and navigator MOCs. In particular, navigators, who are seen to be the healthier of the two MOCs with respect to numbers, are perceived by LRPA pilots to be unfairly advantaged as they are free to pursue the ideal professional progression while pilots are required to fill the hard pilot positions with little time to fully round out their careers and compete effectively with their navigator colleagues.

Undoubtedly there will continue to be leadership challenges within the LRPA community as the Aurora Incremental Modernization Project progresses and new roles are brought online for the community. The following is a suggested list of areas of research specific to LRPA operations that could assist in dealing with these issues: (1) the development of meaningful leadership opportunities for LRPA navigators and pilots outside of Sqn command; (2) the modeling of the effect of single seat progression amongst LRPA navigators; (3) the establishment of a comprehensive review of the future use of the Aurora within the current military context; (4) an examination of the requirements of the follow-on aircraft to the Aurora and implications resulting from its planned introduction; and (5) the examination of possible mentorship systems to ensure COs are properly prepared for their important jobs.

Maritime Helicopter³⁶

Introduction. With the introduction of the Sikorsky S-61 (CHSS-2 Sea King) in the early 1960s, the Royal Canadian Navy began a new chapter in Helicopter Anti-submarine Squadron (HS) operations. In addition to a new helicopter, the Navy also brought to the forefront the concept of big helicopters operating from small ships with the conversion of the St Laurent class DDEs to DDHs. During this time period, naval aviators flew Sea Kings, as the Navy was responsible for its own aviation force generation and force employment.

Throughout the Cold War, the main task of the HS squadron was to provide a capable anti-submarine platform in the North Atlantic. The speed and agility of the Canadian DDH in concert with the all-weather, day-night anti-submarine warfare capability of the Sea King proved a formidable combination.

The evolution of Canada's HS force, as a distinct military capability, was most affected by CF unification, introduced in 1968, which abruptly transferred responsibility of all HS training and readiness from the RCN to the newly formed air element of the CF. Since that time, HS (later Maritime Helicopter [MH]) has languished as an orphan, fulfilling its traditional duties as a Canadian Fleet asset while struggling for recognition and support from the Air Force.³⁷

Since unification, command and control of the MH capability has presented significant challenges as Sea King units are wholly or partially assigned to various Joint Task Forces on an as required basis. And while individual fighting units (detachments) are most familiar and effective operating as integral shipborne units, their force generation and air maintenance

³⁶ This section was written by LCol Doug Moulton Counter Surface Operations Sea, Canadian Forces Aerospace Warfare Centre, 8 Wing Trenton.

³⁷ A 2005 Directory of 1 Canadian Air Division Organizations failed to show 12 Wing as an Air Force Formation.

support remain the purview of the Air Force. Over the years this has slowly led away from the traditions associated with naval aviators as those who served within that service retired.

The fall of the Berlin Wall and the eventual collapse of the USSR immediately brought into question the need for ASW-specific forces in the CF. The desire to reap a peace dividend was significant and impacted greatly on the CF and the HS community. As governments moved to cut military budgets in the early 1990s to meet fiscal realities, the new world order emerged. But instability was the new reality, and Sea Kings deployed as part of OP FRICTION to conduct Maritime Interdiction Operations (MIO) and mine counter-measures.

The conduct of OP DELIVERANCE in Somalia brought new challenges as Sea Kings were used in roles not previously envisaged for the aircraft. Tactical airlift from ship-to-shore became a mainstay for the embarked aircrew along with forays ashore in support of land operations as Sea Kings flew top cover for convoys. This was truly the first demonstration of the Sea King as a multi-role aircraft outside of its traditional blue water operations.

After 9/11 the Sea King community once again deployed en masse to the Persian Gulf in support of OP APOLLO and the war on terrorism. Over the next three years, a stream of HelAirDets followed the initial deployment of five. The effect on the community has been severe as the ability to force generate has suffered significantly as a result of the operational tempo, the age of the aircraft and its supportability, and this situation is unlikely to improve in the near future.

In addition to force generation issues, the MH community is in the process of preparing for the introduction of the S-92 (CH148 Cyclone) as the replacement for the Sea King. The challenge of introducing a new weapons system 45 years more advanced than the current Sea King is significant. Doing so while attempting to maintain support to the Navy and the SCTF, through the modification of 5 CH124Bs, will be daunting and no doubt provide some challenging leadership issues in the future.

Community Jobs or Roles. The MH community is involved in numerous roles in both the expeditionary and static environments. These roles include, but are not limited to, surface and subsurface warfare, logistics support, transport, Search and Rescue and support to other government departments. All of these roles are conducted within the expeditionary construct during naval deployments. As an integral weapons system to the ships on which we deploy, the roles of surface and subsurface warfare are critical to the ship's overall survival. The roles of logistics support, transport and SAR are a natural consequence of the versatility of helicopters in general. Support to OGDs occurs both ashore and afloat depending on the requirements of these agencies, with counter-drug operations and fisheries patrols just being two OGD support roles. Regardless of the base of operations, the force employment of MH community remains unchanged.

Organizational Structure. As a result of the MH community's operations abroad, the organizational structure used in executing its roles is one that fits easily within the naval chain of command. Whether the command is national or combined, the overall look and feel is the same.

At the helicopter air detachment level, the senior air officer (detachment commander) is a department head reporting to the CO of the ship. The ship's CO has operational control (OPCON) of the helicopter, its crew and maintainers.

The Task Group Air Officer (TG Air O) is the Task Group Commander's subject matter expert within the TG on the employment of MH resources and represents the concerns of the deployed HelAirDets. The TG Air O is responsible for producing the operational air tasking order (OP TASK AIR) on the commander's behalf. This order is similar to an Air Tasking Order (ATO) but on a smaller scale.

Command and control of MH forces ashore may be substantially different than at sea. With the recent stand-up of Joint Task Force Atlantic (JTFA), under the command of Commander Canada Command, the command and control of MH assets within the JTFA Area of Responsibility (AOR) has shifted. Previously, under the Operational Control (OPCON) of Maritime Air Component (Atlantic) [MAC (A)], this arrangement has been replaced by the MH forces coming under the Operational Command (OPCOM) of the Canada COM Combined Force Air Component Commander (CFACC). When required, the CFACC will chop forces OPCON to the Regional Air Component Commander (RACE) in support of the Comd JTFA. Force generation activities remain under the purview of the Commanding Officer 12 Wing Shearwater who reports to Comd 1 Canadian Air Division.

Relationship of the MH Community with other Communities. There are a number of relationships that are critical to the MH community and its conduct of operations. Within the Air Force, the relationships with the Long Rang Patrol Aircraft community and the Tactical Aviation (Tac Avn) community are of greatest interest.

The relationship with the LRPA community has evolved as a result of similar missions within the maritime environment. In particular, the conduct of anti-surface and subsurface warfare has led to a natural understanding between the communities. The result has been the crossover of personnel between the two communities as skills and perspectives within each community are of value to the other. This professional understanding and appreciation was critical during the introduction of passive anti-submarine warfare to the MH community. During this period, LRPA expertise was essential to the establishment of a passive ASW Sea King capability in an aggressive timeframe. Although the MH community's role is expanding to a more multi-purpose posture with the modification of five CH124Bs for joint roles and the introduction of the CH148 Cyclone, the MH community's relationship with the LRPA community will continue to grow as both communities are now faced with dealing with operations in the littoral battle space of the SCTF.

Prior to the creation of the SCTF, the relationship between Tac Avn and the MH community was based almost exclusively on the shared feeling of being second-class citizens within the Air Force as a whole. This was the result of using air assets generally in support of other environments, namely the Army and the Navy. As the only operational rotary assets within the Air Force, the two communities also shared the challenges of operating in demanding environments, often with what seemed as less than ideal support from the Air Force. This relationship is currently expanding and maturing as a result of the Defence Policy Statement, which has identified the SCTF as the lead element in Canadian responses to international operations. The high profile of this new role and its no-fail nature, along with the littoral battle space within which it will occur, has required that both the MH and Tac Avn communities work hand in hand to ensure the new role's success. The current Canadian Forces Combat Helicopter Force Structure Study and the Combat Helicopter Symposium, entitled "Knocking Down the Walls: Driving Integration into Canada's Operational Helicopter Fleets," are prime examples of this merging of communities. While the MH and Tac Avn continue to move forward, the MH community struggles to reconcile

mandates from the Air Force and the Navy. Until the CF resolves these differences, MH may always fall short of their true capabilities.

Internationally, there are two important relationships which merit discussion. The first is with our US allies, in particular, the US Navy. This relationship is a long-standing one that sees exchange positions between both maritime helicopter communities that have been critical in ensuring that our forces are interoperable. The degree of this integration is apparent in our ongoing support of US Carrier Battle Groups (CVBG). As Canada is the only nation capable of and accepted as being able to provide a replacement for an American frigate within US CVBGs.

The second international relationship, which has been ongoing since the Second World War, is the one with NATO, and in particular, the Standing Naval Force Atlantic (STANAVFORLANT). As a result of Canada's commitment, after the Second World War, to participate in the maintenance of the Sea Lines of Communication between Europe and North America, the MH community has been continuously involved in the operations of this force. The result of this relationship is a comfort the community feels in conducting joint and combined operations on a regular basis. This relationship has also led to the participation in the Joint Interagency Task Force (JIATF), exposing the MH community to counter-drug operations on an international scale. The relationship with NATO has been critical to the community in ensuring that it has remained relevant and interoperable with our allies.

The final, and most important relationship, that merits discussion is the one with the Navy. This relationship is one that has evolved from the days when naval aviators flew the original Sea Kings in the 1960s to the Air Force-supported operations of today. Despite the challenges of joint operations and the two different cultures that support these efforts, there is an inherent understanding between these two communities that in order for each to flourish, there is a requirement to be mutually supportive. The result has been a relationship that encourages the individuality of each community, with the requirement to fully understand the needs of the other. It is this marriage of opposites that makes for an effective combat team capable of providing coordinated effects around the world. The challenges brought by SCTF to this relationship will be the true test of this understanding as both the Navy and the MH community move forward.

Description of the Role of Reserves in the MH Community. The Reserve Force plays an important and vital role within the Maritime Helicopter community. Although employed primarily as individuals within operational, training, maintenance, and test and evaluation units, Reservists are instrumental to the force generation required within 12 Wing. However, because of the length of the MH community's normal three- to six-month operational deployments, few Reservists are able to participate in them. This lack of Reserve participation in deployments is not a critical factor, since, on average, only 8–10 percent of all 12 Wing personnel are actually involved in force employment with the remainder being directly involved in force generation activities. With the continued challenge of enrolling and retaining Regular Force personnel, the employment of Reservists, in appropriate roles, will remain crucial to MH operations.

Factors that Affect Culture and Leadership in the MH Community. While it is acknowledged that there are two main types of leadership within the Air Force, that associated with the operation of aircraft and the cockpit environment, and the traditional leadership roles of the COs and Det Comds, they are still inextricably linked.

The crew of a Sea King generally is composed of the aircraft captain, co-pilot, navigator and airborne electronic sensor operator with either the aircraft captain or the navigator filling the role of the mission commander (Maritime Helicopter Crew Commander [MHCC]). Within this environment, command success is predicated on the MHCC's capability in two areas. First, the MHCC must demonstrate a command of their primary job within the aircraft. This ability forms the foundation on which the crew will base its trust in the MHCC and their decisions. Second, the MHCC must ensure that communication within the crew meets the needs of the mission and that the coordination necessary to complete the mission is maintained. This often requires the MHCC to manage egos and personalities during often-complicated evolutions in conditions of extreme risk.

Having demonstrated the ability to function as an MHCC, if selected to be a Det Comd, the individual now has the challenge of leading the HelAirDet within the confines of a naval vessel. This requires the Det Comd to possess the ability to communicate with the naval chain of command at various levels, such as the CO, Executive Officer and Coxswain. This communication is essential if the HelAirDet is to be accepted within the ship's company. The Det Comd must also be able to balance the need of the HelAirDet to remain distinctively Air Force, while at the same time ensuring that there is a real feeling amongst the ship's crew that the HelAirDet is part of the ship's company. Finally within the HelAirDet, the Det Comd must be able to meet the needs of the maintainers to balance their ability to do their jobs with the requirements of shipborne life and the tactical environment at hand.

As an MH Squadron's main focus is on force generation, the CO's leadership challenges differ significantly from those of a Det Comd. Given the tasks of coordinating the professional development of all their squadron personnel while at the same time generating capable and viable HelAirDets requires the CO to maintain an overall grasp of the big picture. This can be a challenge when those who are conducting the training are not provided with the tools and support necessary to meet the objective. Given the complexity of this task, the CO must have the support of all their branch heads in executing the plan.

Who is considered to be in the Air Force in the MH Community? Although one could say that all personnel wearing light blue and those Navy and Army support personnel at 12 Wing are considered to be part of the Air Force family, not all feel that way. This feeling of abandonment by some comes from the result of personnel perceiving the MH community as being taken for granted, needed only when required by the respective environments or simply as a bargaining chip in high level negotiations. Whether it is the disassociation that results from being remote from 1 Cdn Air Div and managed by the respective Coastal Commanders, or the fact that the MH community operates on a daily basis with the Navy, there is no strong connection between the MH community and the Air Force as a whole.

Conclusion and Summary of Main Issues. The challenge of leadership in the new world order should not be underestimated. That being said, MH leaders have been exposed to some of the most challenging operations over the last decade and this experience should serve them well.

The MH community's continuing joint operations with the Navy ensure that the community will have no unassailable challenges as the CF continues to move toward more integrated operations. The recent initiatives associated with SCTF and the closer working relationships with the Tac Avn community will pay large dividends, not only in the preparation for SCTF initial operating capability (IOC) in December 2007, but in preparation for the arrival of the Cyclone in November 2008. Given the current projected requirements for HelAirDets

to have deployable personnel to support the SCTF, there will be a requirement for both communities to understand and accept the challenges in staffing, and to adapt accordingly in order to meet these future needs. The movement of personnel within a combined combat helicopter (MH and Tac Avn) community should be seen as a positive step forward as the talents possessed by both communities will be essential in order to operate in the SCTF littoral environment.

The introduction of night vision goggles (NVGs) within the MH community at the same time as the introduction of the new weapons platform will require MH leaders to be cognisant of the increased risk associated with this dual stream approach. Throughout this transition, the MH community will be required to continually provide support to the Navy at a significant level, not only to meet operational needs, but also to preserve the core capability of the community until the Cyclone is fully online.

The following areas are suggested for additional research: (1) dealing with truly multi-role aircraft and limited-role personnel, (2) determining the extent to which multiple roles can be supported given current and future force structures and identifying the core competencies of the MH community of the future (3) establishing a force generation model that is robust enough to meet the needs of SCTF and the Navy, (4) designing professional development models that meet with needs of the operational deployment models, and (5) identifying what is truly required from a helicopter fleet perspective to support the SCTF and the DPS.

Tactical Aviation³⁸

Introduction. This section presents a human perspective on the evolution of leadership within the Tactical Aviation community. Tactical Aviation within the Canadian Forces is comprised of those aerospace forces that directly support land force operations, and typically operate under the operational control of the Land Component Commander (LCC). By definition, these assets include helicopters, light fixed-wing aircraft, and unmanned aerial vehicles (UAVs). Presently all Canadian Tactical Aviation forces are grouped under the command of the Commander, 1 Wing.

The predecessor to 1 Wing was 10 Tactical Air Group (10 TAG). The origin of 10 TAG was with the inauguration of Force Mobile Command (FMC) in October 1965. As a Tactical Aviation cell within FMC, its aviation resources consisted of a large number of assets located at Rivers, Manitoba including 1 Transport Helicopter Platoon (a Royal Canadian Army Service Corps unit equipped with 10 CH113A Voyageur helicopters), 408 Tactical Support and Reconnaissance Squadron composed of 18 CT33 Silver Stars, plus an L19 Birdog training unit. The whole fleet of L19s consisted of 20 aircraft split between the training unit, and the Air Observation Post (AOP) Troops, which were integral to the artillery regiments located at Gagetown, Petawawa, Shilo and West Germany. Finally there was a group of CH112 Hiller helicopters working with the armoured regiment in Germany.

From 1966 to 1967, several changes were made to the structure of the Tactical Aviation cell of Mobile Command and the aviation assets under its control. In August 1966, 1 Transport Helicopter Platoon was relocated to St-Hubert (six Voyageurs) with a permanent detachment in Namao (four Voyageurs). In June 1967, 429 Squadron was established at St-Hubert with the CC115 Buffalo transport aircraft.

³⁸ This community description was written by Maj Ken Pothier, Counter Surface Land 3, Canadian Forces Aerospace Warfare Centre, 8 Wing, Trenton.

The year 1968 marked an important step in the evolution of aviation within FMC. During that year, 1 Transport Helicopter Platoon was redesignated 450 (Transport) Helicopter Squadron and a permanent detachment of seven CC115 Buffalo aircraft was established at Namao leaving eight Buffalos in St-Hubert. In order to introduce new aircraft, two operational training units were formed: 434 Tactical Fighter (Operational Training) Squadron, equipped with the CF5 Freedom Fighter aircraft at Cold Lake and 403 Helicopter (Operational Training) Squadron equipped with first the CH118 Iroquois, and later with the CH135 Twin Huey and CH136 Kiowa helicopter, at Petawawa. In August of 1968, the “Air Cell” of Mobile Command became Headquarters 10 TAG with all of the air units of FMC coming under command of the newly formed Headquarters. Later that same year, 7 Tactical Air Wing at Calgary, 8 Tactical Air Wing at Petawawa and 1 Aircraft Field Maintenance Squadron (1 AFMS) at Cold Lake were added as units of 10 TAG. The Field Technical Training Unit (FTTU) was also formed and located in Petawawa.

In January of 1969, the Air Reserves were transferred from Air Transport Group to FMC. This move eventually provided FMC with six Air Reserve Squadrons flying the Otter and four Air Reserve Regional Headquarters and Regular Support Units based at Montreal, Toronto, Winnipeg and Edmonton. Later in 1969, the first French-speaking squadron of the Canadian Forces was formed—433e Escadron tactique aérienne de combat at CFB Bagotville equipped with CF5s. As well, three L19s were assigned to the newly formed francophone artillery regiment at CFB Valcartier.

A number of major changes occurred within 10 TAG during the period 1970–1971. The AOP Troops at Valcartier, Petawawa and Calgary each acquired a Cessna 182 with a fourth aircraft being assigned to FMCHQ. On 1 April 1970, 408 Squadron was disbanded and its roles taken over by 433 and 434 Squadrons, and 429 Squadron was placed under the command of Air Transport Command. In January 1971, 1 AFMS moved from Cold Lake to Namao (near Edmonton) to provide maintenance for the helicopters in Western Canada, and 2 AFMS was activated at Uplands to provide the same support in Eastern Canada. The same year, a flight of CH135s (mainly used for VIP transport) was added to the inventory of 450 Squadron in Ottawa. With the addition of the CH135s, 408 Squadron Namao, 422 Squadron Gagetown, 427 Squadron Petawawa and 430 Escadron Tactique d’Hélicoptères (ETAH) Valcartier were all activated.

In 1972 the L19s and Cessna 182s of the AOP Troops were retired with the introduction of the CH136s into the Tactical Helicopter Squadrons. During the summer of 1972, 403 Helicopter (Operational Training) Squadron was moved from Petawawa to Gagetown, while 1 Field Technical Training Establishment (1 FTTE) remained in Petawawa.

In September 1975, 10 TAG, like all other air formations of the CF, was put under command of the newly formed Air Command, which established its headquarters at Winnipeg, Manitoba. The aviation section of 10 TAG moved into its own building in St-Hubert and 3 and 4 Air Reserve Wings were put under the command of Training and Transport Group respectively. However, 1 and 2 Air Reserve Wings and their Regular Support Units, commanded by the newly formed Air Reserve Group, remained under operational control of 10 TAG. In 1975, the CH135s were removed from 450 Squadron and the Voyageurs were replaced by eight CH147 Chinooks in Ottawa and Namao.

During the summer of 1977 the FTTU was moved from Petawawa to CFB Chatham. Then in 1979, 1 and 2 AFMS were disbanded and the operational squadrons assumed the responsibility for all maintenance of their aircraft. Also in 1979, 450 Squadron’s

detachment in Namao was reformed as 447 Squadron. In August 1980, 422 Tactical Helicopter Squadron was disbanded and 10 TAG established an Air Group Operations School (AGOS) at Gagetown.

In April 1981, 1 and 2 Air Reserve Wings commenced their re-equipment program with the arrival of the CH136 Kiowa. The delivery of eight Kiowas to each of the Air Reserve Regular Support Units in Montreal and Toronto was complete by September 1981. The era of the CC123 Otter aircraft came to an end in January 1982 with the retirement of the last aircraft.

In June 1982, the 10 TAG Air Traffic Control Unit was moved to Air Command Headquarters, but three Air Traffic Control Detachments remained under the control of 10 TAG as they were integrated into the squadrons located at Gagetown, Valcartier and Petawawa. The next month, 434 Tactical Fighter Squadron and 433^e Escadron tactique aérienne de combat were reassigned to the operational command of the newly formed Fighter Group.

In 1985, 3 FTTU moved from Chatham to Bagotville and in 1987, 1 and 2 Air Reserve Wings were reorganized to become 1 and 2 Tactical Aviation Wings (TAWs) with the two Regular Support Units being disbanded. The retirement from service of the Chinooks in 1991 resulted in the disbandment of 447 Squadron and the reorganization of 450 Squadron into a Composite Squadron equipped with the CH135. In 1990, a Special Emergency Response Team (SERT) flight equipped with three Hueys was added to the establishment of 450 Squadron.

The year 1992 saw dynamic changes continue. As part of the closure of the Canadian bases in Germany, 444 Light Observation Helicopter Squadron located at Lahr was disbanded. Some believed that the announcement to purchase Bell 412 helicopters to replace the CH136 Kiowa and CH135 Twin Huey fleets would enable the Group to provide better support to the Army in the tactical lift role. The long-term transition plan was initiated in July 1992 when 427 Squadron in Petawawa was reorganized as a Huey squadron and 430 ETAH in Valcartier as a Kiowa squadron where both squadrons exchanged their Kiowa and Huey assets respectively. The Land Aviation Test and Evaluation Flight (LATEF) was formed at 403 Squadron with the mandate to carry out all land force operational test and evaluation requirements.

On 25 June 1996 450 Squadron was disbanded and the counter-terrorist role transferred to 427 Squadron. In 1997 10 TAG was reformed as 1 Wing with the new headquarters moving from St-Hubert to Kingston. 1 Tactical Aviation Wing was reorganized into 438 Squadron, St-Hubert and 2 Tactical Aviation Wing moved from Toronto to Borden and was reorganized into 400 Squadron. On 1 February 2006, 427 Squadron was assigned to the Operational Command of the newly formed Canadian Special Operations Forces Command. In addition to the two Reserve-heavy squadrons, 400 Sqn and 438 ETAH, two operational tactical helicopter squadrons remain based at Edmonton (408 Sqn) and Valcartier (430 ETAH). 403 Helicopter Operational Training Squadron remains in Gagetown.

Community Jobs or Roles. Tactical Aviation fulfils its mission of providing integral support to the Land Forces through the provision of mobility, firepower and reconnaissance. The execution of this mission in the static (from garrison), deployed (domestic operations) or expeditionary (international operations) environment is done in virtually the same manner. During the 1970s, 1980s and into the early 1990s the operation of the CH136, Kiowa (light observation helicopter), CH135, Twin Huey (utility tactical transport helicopter) and CH147 Chinook (medium transport helicopter) fleets allowed Tactical Aviation to make a significant contribution in supporting the land force. With the termination of all three

aircraft fleets and the transition to the CH146 Griffon, a change in capability resulted. The operation of a single helicopter fleet resulted in a reduction in the capability to provide mobility (loss of the CH147), a greatly reduced capability to carry out reconnaissance and the complete loss of the capability to provide firepower (through the provision of direction of fire and forward air controlling) with the loss of the CH136.

Organizational Structure. The organizational structure of Tactical Aviation has undergone some major changes during the past three decades. Units have been maintained in Gagetown (403 Helicopter Operational Training Squadron), in Valcartier (430 ETAH), and in Edmonton (408 Tactical Helicopter Squadron). Changes to structure have included: the closure of CH147 Chinook Squadrons 447 Squadron, (Edmonton) and 450 Squadron (Ottawa); the restructure of the Air Reserve organization in St-Hubert from 1 Tactical Aviation Wing to 438 ETAH; the restructure and move (to Borden) of the Air Reserve organization in Toronto from 2 Tactical Aviation Wing to 400 Squadron; the closure of 444 Squadron, Lahr, Germany; the move of 1 Wing (formerly 10 Tactical Air Group) Headquarters from St-Hubert to Kingston; and most recently the assignment of 427 Tactical Helicopter Squadron to the Canadian Special Operations Forces Command. Tactical Aviation Units have been deploying (for training and for domestic and international operations) with the Land Forces since its formation. These deployments have been task tailored to meet the needs of both the land force and the aviation units. Tactical Aviation Units have for the most part deployed as Tactically Self-Sufficient Units meaning that units were structured with elements of command and control (headquarters), operations (flying flights), aircraft maintenance and support. Expeditionary Tactical Aviation deployments have also been task tailored as TSSUs. With an increase in the frequency of deployments, TSSU structures have been standardized with only minor modifications being made based on specific task requirements.

Relationship of the Tactical Aviation Community with other Communities. Tactical Aviation has maintained a very close relationship with the Land Force. Challenges to this relationship have come up during those periods when Tactical Aviation Forces were committed for lengthy deployed operations, such as peacekeeping, and were not available to support other Land Force operations. Furthermore, loss of operational skill sets during peacekeeping operations required lengthy reconstitution periods resulting in further separation from the Land Force. Tactical Aviation operations have included support to the Land Forces of other nations including, but not limited to, the United Kingdom and Holland. The strength of the relationship between Tactical Aviation and the Land Force has varied primarily due to the personalities of the senior leaders involved. Not all Land Force commanders have experienced the responsiveness and reliable support that should characterize Tactical Aviation, and, therefore may not appreciate the capabilities that it could bring to operations. The word “could” is used in the previous sentence because in reality many factors affect Tactical Aviation’s effectiveness and availability to the Land Forces, including serviceability of aircraft, the environment (weather and other environmental conditions), personnel experience levels and other government department demands. Not all Tactical Aviation commanders have been successful in educating and selling the characteristics (both strengths and limitations) of Tactical Aviation to the Land Force. As with any relationship, simply being available is a good first step, but much work remains if that relationship is to grow and strengthen.

Description of the Role of Reserves in the Tactical Aviation Community. Tactical Aviation sets the example for the employment and integration of Air Reserves into a Total Force structure. The role of the Air Reserve within Tactical Aviation has changed from one

of providing individual augmentees (from 1 and 2 TAW) for specific missions during the 1970s and 1980s to one where Air Reservists are integrated into each Tactical Aviation Unit today. For example, fully one third of 1 Wing is made up of Air Reservists, and 1 Wing would not be able to function at its present operational tempo without the support provided by individual Air Reservists and by the two Air Reserve-heavy units. These two units, 400 Sqn and 438 ETAH, carry out individual aircrew training thereby greatly reducing the pressure on the Regular Force Operational Training Unit. Additionally, they carry out missions and operations based on the availability of personnel which in the past few years has been very good. The execution of these missions and operations greatly reduces the strain on the other already heavily tasked units of 1 Wing. As an example, OP HURRICANE (support to the High Arctic Data Communications System) has been exclusively carried out by 400 Sqn and 438 ETAH alternatively for several years. The Air Reserves, within 1 Wing, are professional, appreciated, available and equals.

Factors that Affect Culture and Leadership in the Tactical Aviation Community. The factors influencing the present day culture and leadership styles of the Tactical Aviation community are many and varied. Beginning with the introduction of the CH135, CH136 and the CH147 in the late 1960s and early 1970s the influence of the Land Force began, and continues to be, the single most important factor affecting the present state of culture and leadership within Tactical Aviation. The influence of the Land Force on the Tactical Aviation community has resulted in the organization being very formal and structured in its approach to problem solving, placing emphasis on mission accomplishment, the professional development of its personnel, on staff functions and developing its leaders. Tactical Aviation has benefited greatly from the influence of Land Force personnel, which started during the 1970s and 1980s when personnel from the L19 (Birdog) and CH112 (Hiller) organizations transferred into the new CF helicopter organizations, and helped to create a unique culture within tactical aviation. These personnel had been integral to the Land Forces providing close support in the form of direction of fire (L19) and recce (CH112). The simple fact of living and working on Land Force bases made great impact on how these individuals approached operations, training and staff work. Operating within the Land Force chain of command also made a great impact on the officers and senior NCOs involved. During the 1970s and 1980s many of the Squadron Warrant Officer positions (senior NCM and advisor to the CO), within tactical aviation units were filled by combat arms NCOs. This practice fell out of favour in the 1990s when it was decided to groom NCOs from within the ranks of the aircraft maintenance organizations and the Flight Engineer occupation to fill the Squadron Chief Warrant Officer positions. The transition, in the mid-1990s, from three aircraft fleets to one also impacted tactical aviation units in that they lost the combat arms NCO “observers” that were key CH136 aircrew. In addition to their critical aerial role the observers provided great insight and influence into field operations, field living and discipline. Recently the introduction of the “Mission Specialist” (normally a combat arms NCO) into CH146 operations has renewed a link, albeit a small one, with the Land Force. The role of the Mission Specialist is to “assist tactical aviation elements in the planning and execution of assigned missions, operating of onboard sensors and mission kits, conducting air to ground reconnaissance, and directing the engagement of targets while employed as a member of a tactical aviation crew.” Another major influence regarding the cultural development of tactical aviation is the exposure of tactical aviation personnel to field training exercises. The interface of officers and senior NCOs with Land Force leaders during these exercises has had a great impact. Reductions to both the frequency and duration of field exercises in recent years, however, have had some impact on the working relationship between Tactical Aviation and Land Force personnel.

The training of NCMs and officers within Tactical Aviation does differ from other Air Force communities in exposing its members to the Land Force. Tactical Aviation officers undergo structured professional development including training in Land Force doctrine and, for some, attendance on the Army Operations Course (formerly called the Canadian Land Forces Command and Staff Course). The relationships that form between tactical aviators and Land Force officers during this training are significant and long lasting. NCMs receive most of their exposure to the Land Force from exercises and through affiliation in garrison. The Land Force influence that formal training brings to NCMs is less than it is for the officers. The culture within the Reserve-heavy units has changed during the last 20 years in that it now reflects a similar culture to that of the other Tactical Aviation units mainly because of the influence of personnel (mainly the officers) who have come from the Regular Force.

Who is considered to be in the Air Force in the Tactical Aviation Community? The vast majority of members of the Tactical Aviation community affiliate themselves with the Air Force. There are some, however, that might feel a closer link to the Land Force. Those within Tactical Aviation who were serving in the 1970s, 1980s and early 1990s and who had a very close affiliation with their Land Force brothers and sisters (some may even have been Combat Arms Officers or NCMs) might feel a closer link to the Land Force than the Air Force. Intense formal training with the Land Force both in garrison and in the field has contributed greatly to this mind set. Many Tactical Aviation officers would consider Land Force officers a closer peer than officers from other Air Force communities. The International Exchange program has had a positive influence on Tactical Aviation. Canadian Tactical Aviators returning from two or three year tours of duty with American, French and British forces bring with them new ideas and operational experience. Although few in numbers, these individuals have had an important influence on community mindset and tactical procedures.

Conclusion and Summary of Main Issues. The impact of the possible integration of the Tactical Aviation community with the Maritime Helicopter community resulting from the standup of the Standing Contingency Task Force and the requirement to realign operational helicopter resources into what is being called the “Combat Helicopter Force” will require study and research in order to properly manage the issues.

Part 3 – Conclusions

This chapter has provided a picture of the Air Force from the perspective of its various communities. The picture is, however, complex and difficult to interpret because of the diversity found in the multitude of communities that make up today’s Air Force.

One example of this diversity is found in the descriptions of community jobs or roles, one of the themes of the community descriptions, because how authors described their community jobs or roles often depended on how individuals saw themselves at a certain point in time. For example, a community could be seen to be all those who fly or support aircraft in a certain role and in the case of the Canadian Air Force the Fighter community could be defined as all those who fly or support the CF18 fighter aircraft, e.g., the pilots, maintenance and support personnel assigned to a location where CF18s are based. Another way of looking at a community was through the lens of occupation, e.g., all those whose occupation involved aircraft maintenance, irrespective of the operational community to which they belonged. For instance, when working on fighter aircraft, maintenance personnel might identify with the Fighter community, but if assigned to maintain aircraft in another

community, they could then identify with that community. A third way of defining an Air Force community, based on occupation, was used by those who were members of “purple” occupations, i.e., those who could be employed in any CF Environment because their jobs were not directly related to operating or supporting aircraft. These individuals might see themselves as members of an Air Force community, e.g., Air Mobility, while they were serving with that community, but they might have a different self-perception if they were posted to support another CF community.

Other themes in the community descriptions were based on the concepts of static (or MOB), deployed and expeditionary operations. The questions posed to the community description authors were designed to elicit differences in jobs or roles as well as organizational structure, based on whether the community was conducting operations from an MOB, was deployed, or was engaged in expeditionary operations. Once again, the responses varied widely depending on the type of community. Some communities, by nature of their roles (e.g., Maritime Helicopter and Air Force Communications and Information Services) perform largely the same jobs and roles and are organized virtually the same way for MOB, deployed or expeditionary operations. Other communities, like Airfield Engineers, perform mainly the same core jobs related to infrastructure as they would at an MOB, when on deployed operations or when on expeditionary operations; however, for the latter two types of operations they must deal with a number of unique tasks and equipment requirements. Still other communities (e.g., LRPA, Fighter and Air Mobility) have different jobs and roles or different organizational structures depending upon the nature of the operation.

Two other themes in the community descriptions, the relationship of each community with other communities and factors that affect culture and leadership in each community, also reflected the diversity and complexity of each community. The relationships among communities were especially complex given the number of Air Force communities and their various relationships. This complexity was particularly evident for “purple” communities like Military Police and Logistics. In the Military Police example the existence of two chains of command, operational and technical, complicated its relationship with other communities in the Air Force. Similarly, the diversity of occupations in the Logistics community combined with the fact that logisticians are routinely employed across the CF Environments made that community’s network of relationships difficult to describe, and, in some cases, problematic. The factors that affect culture and leadership in each community were intrinsically linked to the jobs or roles that each community performed as well as its relationship with other communities. For example, the nature of the Fighter and Air Mobility operational communities gives them a more “pure” Air Force culture and, one could argue, approach to leadership. The history and roles of the Tactical Aviation and Maritime Helicopter communities plus their relationship to the Army and Navy respectively gives them arguably more hybrid cultures and leadership styles.

The responses to the theme of the role of the Reserves in each community were as diverse as those for other themes. In general terms, the role of the Reserves in any one community was governed by the nature of employment in that community. For example, training and currency requirements usually preclude Reservists being employed directly in operational flying positions in the Fighter community, whereas in the Airfield Engineer community the role and mission of Reservists is the same as their Regular Force counterparts. Furthermore, the Airfield Engineer community has even been able to establish community-based Reserve units in four locations. Similarly, the Tactical Aviation community has integrated Reservists into its units, and two squadrons are composed mainly of Reservists.

The question of who is considered to be in the Air Force in each community, like the other themes, provoked many different responses. In the more homogeneous communities, like Aerospace Maintenance, Air Mobility and Search and Rescue, Fighter, and LRPA, virtually everyone was considered to be in the Air Force. This issue was more problematic for other communities. For example, due to the close working relationship between the Navy and the MH community and the Army and the Tactical Aviation community, these communities did not see themselves as members of the Air Force in the same way as those in the more homogeneous communities. In “purple” support communities, like Logistics and Military Police, identification with the Air Force could be quite tenuous and depended on employment experience. On one hand, an Army logistician working with the Tactical Aviation community might feel very little connection with the Air Force. On the other hand, personnel in the Military Police who wear light blue uniforms and who have served most of their career on air bases might feel a strong affinity with the Air Force.

The wide variety in the responses to the questions posed cannot easily be analyzed by any one approach to culture. The three perspectives describe in the introduction to this chapter do, however, provide ways of interpreting the responses.

From a differentiation perspective, the Air Force is composed of a number of discrete subcultures, and these could be depicted by the CAGs. The shortcoming of this perspective is that it does not take into account the relationship among communities and the fact that one person, depending on the circumstances, could perceive himself as being a member of more than one community. The fragmentation perspective allows us to deal with this reality by depicting the Air Force as being comprised of many overlapping communities, some defined by operational role (e.g., long range patrol), some by aircraft type (e.g., CF18), some by function (e.g., aircraft maintenance), some by occupation (e.g., airfield engineer), some by location (e.g., all those serving at a specific location whether in Canada or abroad), and the list goes on. The fragmentation approach takes into account the fact that these communities overlap and that one person could perceive himself as a member of more than one community at a time (e.g., air mobility air navigator on a CC130 deployed to Camp Mirage).

Some of the contributors to the community descriptions expressed the belief that the separate cultures and operational philosophies engendered by the various Air Force communities have been detrimental to the creation of a single Air Force approach to the use of Canadian aerospace power. They argue that, particularly for the officer and senior NCM corps, there needs to be a common understanding of how aerospace power can be best applied in a Canadian context. This common understanding is not being imparted in Air Force professional military education, according to some. And they feel that without some unity of purpose at senior levels in the Air Force, advocacy for separate community interests will interfere with operational effectiveness. Those who hold this integrationist view believe that there should be a strong Air Force culture with identifiable values and norms that are generally shared by all members of the organization.

All of these perspectives on Air Force culture have merit, and each makes a contribution to better understanding the Air Force as an organization, its culture and its subcultures. Therefore, they should all be considered when trying to effect organizational or culture change or conduct research in areas related to Air Force leadership and command.

Research Topics

Throughout this volume, a number of suggestions have been made for future research in the domain of Air Force leadership and command. These suggestions have been consolidated here for the convenience of the reader.

In Chapter 5 the following specific recommendations were made with respect to future research related to Air Force leadership, as follows:

- a. What are the leadership differences by air force community, e.g., among aircrew vs maintenance vs support?
- b. What are the leadership differences in expeditionary vs other types of operations?
- c. How does diversity in air force teams affect the effectiveness of various leadership behaviours?
- d. What are the implications of the unique characteristics of air force leadership for joint/integrated operations?

Other areas for future research related to Environmental (service) Leadership are:

- a. How does the physical environment and functions of the Army, Navy and Air Force affect leadership in each CF Environment or foreign military service?
- b. What is the effect of different military organizational cultures on leadership?
- c. What is the effect of different military organizational cultures on the hierarchies of loyalty in the three CF Environments?
- d. What is the impact of different Environmental or service leadership styles on joint and combined operations?

In Chapter 6 it was recommended that the following topics be explored related to command in an Air Force context:

- a. The creation by the RCAF of large operational, as well as administrative, command structures and processes, in the 1945-68 period.
- b. The evolution of the CF air element command and control structures and processes from 1968 to the end of the Cold War.
- c. The evolution of command, control and command and control in the period 1939 to the end of the Cold War.
- d. The evolution of command, control and command and control in the post-Cold War period.
- e. The effect of “theories” of war, such as EBO, RDO, “shock and awe,” on command, control and command and control in the post-Cold War period.

In Chapter 7 the following specific recommendations were made with respect to future research related to Air Force leadership and command.

- a. Aerospace Maintenance community:
 - Joint Operations Command and Control
 - Expeditionary Engineering
 - Expeditionary Flight Testing

- C4ISR
 - Space Operations
 - Unmanned Aerial Vehicles
 - Support to Operations
- b. Air Mobility and Search and Rescue community:
- How the diversity of fleets and roles affect training, operations and career progression.
 - How best to organize, employ and command Air Mobility forces without adversely affecting the complexity and diversity of its functioning.
- c. Long Range Patrol Aircraft community:
- The development of meaningful leadership opportunities for LRPA navigators and pilots outside of squadron command.
 - The modeling of the effect of single seat progression amongst LRPA navigators.
 - A comprehensive review of the future use of the Aurora within the current military context.
 - An examination of the requirements of the follow-on aircraft to the Aurora and implications resulting from its planned introduction.
 - The examination of possible mentorship systems to ensure COs are properly prepared for their important jobs.
- d. Maritime Helicopter community:
- Dealing with truly multi-role aircraft and limited-role personnel.
 - Determining the extent to which multiple roles can be supported given current and future force structures.
 - Identifying the core competencies of the MH community of the future.
 - Establishing a force generation model that is robust enough to meet the needs of the Standing Contingency Task Force and the Navy.
 - Designing professional development models that meet the needs of the operational deployment models.
 - Identifying what is truly required from a helicopter fleet perspective to support the SCTF and the Defence Policy Statement.
- e. Tactical Aviation community:
- The impact of the possible integration of the Tactical Aviation community with the Maritime Helicopter community resulting from the standup of the Standing Contingency Task Force.
 - The requirement to realign operational helicopter resources into what is being called the “Combat Helicopter Force.”

Glossary

The definitions contained in this Glossary are derived from a number of sources, foremost of which are the *Defence Terminology Bank*, the *NATO Glossary of Terms and Definitions (AAP-6)* and *Leadership in the Canadian Forces: Conceptual Foundations*. The publication source of all definitions is indicated in parentheses at the end of each term, utilizing the following abbreviations:

- a. AAP-6 – *NATO Glossary of Terms and Definitions (A-AD-AAP/JX-001)* www.dtic.mil/doctrine/jel/other_pubs/aap_6_04.pdf
- b. AFDD-1 – *Air Force Basic Doctrine* www.e-publishing.af.mil/pubfiles/af/dd/afdd1/afdd1.pdf
- c. AFDD 1-2 – *Air Force Glossary (USAF)* www.e-publishing.af.mil/pubfiles/af/dd/afdd1-2/afdd1-2.pdf
- d. AJP-01 – *Allied Joint Doctrine (AJP-01(B))*
- e. B-GA-400 – *Out of the Sun*
- f. B-GA-401 – *The Air Force Glossary* (draft)¹
- g. B-GJ-005 – *CF Operations (B-GJ-005-300/FP-000)* www.dcds.forces.gc.ca/jointDoc/docs/B-GJ-005-300_e.pdf
- h. B-GL-300 – *Command (B-GL-300-003/FP-000)* www.army.forces.gc.ca/ael/pubs/300-003/B-GL-300-003/FP-000/B-GL-300-003-FP-000.pdf
- i. Chapter 5 – Chapter 5 of this book.
- j. COD – *The Concise Oxford Dictionary*
- k. DPOL – Vice Chief of the Defence Staff, *Defence Plan On-line*, Lexicon www.vcds.forces.gc.ca/DPOnline/Lexicon/Intro_e.asp
- l. DTB – *DND Defence Terminology Bank* terminology.mil.ca/ (DWAN only)
- m. JP 1-02 – US Joint Pub 1-02, DOD Dictionary of Military and Associated Terms www.dtic.mil/doctrine/jel/JP 1-02dict/index.html
- n. JWP 0-01 – *British Defence Doctrine* www.mod.uk/DefenceInternet/AboutDefence/CorporatePublications/DoctrineOperationsandDiplomacyPublications/JWP/Jwp001BritishDefenceDoctrine.htm
- o. LCF-CF – *Leadership in the Canadian Forces: Conceptual Foundations* www.cda.forces.gc.ca/cfli/engraph/leadership/conceptual/glossary_e.asp
- p. MCCRT – *Management, Command and Control Reengineering Team*
- q. QR&O – *Queen's Regulations and Orders for the Canadian Forces* admfincs.mil.ca/qr_o/intro_e.asp
- r. SCP – *Glossary for Strategic Capability Planning for the CF* www.vcds.forces.gc.ca/dgsp/pubs/rep-pub/dda/strat/glossary_e.asp

¹ B-GA-401 - *The Air Force Glossary* (draft) was never formally approved for use. It was, however, the only comprehensive glossary of Air Force terminology in existence for many years. It is used here as a source to give the reader the definitions that were in use at the time when many of the events described in this book took place. As such, it is intended to provide context for the events and issues described here, and not to be considered as an up-to-date glossary.

- s. SV – *Strategic Vectors* (A-GA-007-000/AF-004) www.airforce.forces.gc.ca/vision/strategic_e.asp
- t. TAF – “Total Air Force”, Air Reserve Organization website, www.airforce.forces.gc.ca/air_reserve/organization/total_force_e.asp

accountability

A person’s obligation to take responsibility for and explain performance in relation to commitments made and results achieved. (LCF-CF) See also *responsibility*.

administration

1. The management and execution of all military matters not included in tactics and strategy; primarily in the fields of logistics and personnel management. (DTB/AAP-6) 2. The internal management of units. (DTB/AAP-6)

administrative control

Direction or exercise of authority over subordinate or other organizations in respect to administrative matters such as personnel management, supply, services, and other matters not included in the operational missions of the subordinate or other organizations. (DTB/AAP-6)

aerospace

Means air and space and defines the environment that surrounds the Earth and extends vertically into space from the Earth’s surface. (SV)

aerospace control

Aerospace operations whose objectives are to gain and maintain control of the aerospace environment. Aerospace control includes both counter-air operations, those whose objective is control of the air; and counter-space operations, those whose objective is control of space. Aerospace control assures the friendly use of the aerospace environment while denying its use to an enemy. (B-GA-401) See also *counter-air*.

aerospace expeditionary task force

A temporary grouping of air force units and elements under one commander, formed for the purpose of carrying out a specific aerospace operation or task at a deployed location. The AETF will be capable of deploying, being employed, sustained and then redeployed from locations, including bare-base installations, around the globe. (B-GA-401) See also *task force*.

aerospace forces

Forces that operate within the aerospace medium. This includes forces that control or support those forces. (AFDD 1-2)

aerospace function

The broad, fundamental and continuing activities of aerospace forces. Aerospace functions can most effectively or solely be performed within or from the aerospace environment. They represent the primary operational capabilities of the Air Force by which it accomplishes the assigned Defence Tasks. Aerospace functions can be classified as: fundamental; contributing; enabling; and support. (B-GA-401)

aerospace operation

All activity associated with the planning and application of aerospace power, organized in time and space to achieve specified tasks or objectives. Aerospace operations normally involve the execution of multiple missions within a single aerospace function. (B-GA-401) See also *operation*.

aerospace platform

The vehicles through which aerospace power achieves effect. Aerospace platforms have inherent advantages of speed, reach and manoeuvrability in comparison with platforms that operate in the maritime or land environments. (B-GA-401)

aerospace power

In its broadest context, aerospace power involves the full range of a nation's aerospace capability—military and civilian—in peace as well as war. Military aerospace power is that component of military power that is applied within or from the aerospace environment to achieve effects above, on and below the surface of the Earth. This power is derived from the use of platforms such as aircraft and satellites that are used to control and exploit the aerospace environment for military or national strategic purposes. (SV)

aerospace role

A tactical level activity of aerospace power undertaken as part of a broader aerospace function. Aerospace functions generally include several distinct, but inter-related, aerospace roles. (B-GA-401)

air division

An air combat organization normally consisting of two or more wings with appropriate service units. The combat wings of an air division will normally contain similar type units. (DTB/AAP-6) See also *air group* and *formation*.

airfield

An area prepared for the accommodation (including any buildings, installations, and equipment), landing, and takeoff of aircraft. Note: In all entries involving "airfield" or "aerodrome," the US uses "airfield," and NATO uses "aerodrome." The terms are synonymous. (JP 1-02)

air force

1. The branch of the armed forces charged with generating and projecting aerospace power in defence of the nation and its national interests and institutions. The Canadian Forces is a unified force comprising a single service; however, it has become common practice to refer to the three environmental commands (EC) as the Navy, the Army and the Air Force (B-GA-401). 2. Branch of the armed services operating in the air environment. (COD)

air force team

All personnel, civilian employees of the Department and military personnel, (regular and reserve), employed within Air Command. (B-GA-401)

air group

An air force formation which encompasses a single functional component. (B-GA-401) See also *air division* and *formation*.

air operations centre

The principal air operations installation from which aircraft and air warning functions of combat air operations are directed, controlled, and executed. It is the senior agency of the Air Force Component Commander from which command and control of air operations are coordinated with other components and Services. Also called AOC. (JP 1-02)

airspace control

A combination of airspace organization planning procedures, the resulting control structure and coordinating functions to minimize risks and allow for efficient and flexible use of airspace by all elements involved in air, land and sea operations. (DTB/AAP-6)

air superiority

That degree of dominance in the air battle of one force over another which permits the conduct of operations by the former and its related land, sea and air forces at a given time and place without prohibitive interference by the opposing force. (DTB/AAP-6)

air supremacy

That degree of air superiority wherein the opposing air force is incapable of effective interference. (DTB/AAP-6)

air transport

The movement by air of personnel, equipment and cargo within and between theatres of operations. Also referred to as *airlift*. (B-GA-401)

amphibious operation

A military operation launched from the sea by a naval and landing force embarked in ships or craft, with the principal purpose of projecting the landing force ashore tactically into an environment ranging from permissive to hostile. (DTB/AAP-6)

assign

1. To place units or personnel in an organization where such placement is relatively permanent, and/or where such organization controls and administers the units or personnel for the primary function, or greater portion of the functions of the unit or personnel. (DTB/AAP-6) 2. To detail individuals to specific duties or functions where such duties or functions are primary and/or relatively permanent. (DTB/AAP-6)

authority

The legal right to make decisions, to direct the activities of subordinates with the expectation of being obeyed, and to hold subordinates accountable for their actions and performance. (LCF-CF)

base

1. An area or locality containing installations which provide logistic or other support. (DTB/AAP-6) 2. A locality from which operations are projected or supported. (DTB/AAP-6) 3. Home airfield or home carrier. (JP 1-02) 4. A unit designated as such by or under the authority of the Minister, the function of which is to provide such accommodation and support services for assigned units as may be directed by the Chief of the Defence Staff. (QR&O)

campaign

A set of military operations planned and conducted to achieve a strategic objective within a given time and geographical area, which normally involves maritime, land and air forces. (DTB/AAP-6)

capability

The state of having sufficient power, skills, and ability to carry out a military activity or operation successfully. (LCF-CF)

centralized control

1. In air defence, the control mode whereby a higher echelon makes direct target assignments to fire units. (DTB/AAP-6) 2. In joint air operations, placing within one commander the responsibility and authority for planning, directing, and coordinating a military operation or group/category of operations. (JP1-02) 3. In aerospace employment, the vesting of authority in one commander for planning and directing operations. This centralized planning and direction enables timely allocation and tasking of assets to exploit the speed, range, and flexibility of air capabilities across the entire area. Centralized tasking and allocation of resources is accompanied by progressive decentralization of tasks; execution to the lowest command echelons capable of accomplishment. (AFDD 1-2) See also *decentralized control*.

chain of command

The succession of commanding officers from a superior to a subordinate through which command is exercised. (DTB/AAP-6)

charismatic leadership

A general pattern of influence based on followers' emotional commitment and enthusiastic loyalty and devotion to a leader or the leader's cause. Charismatic leaders typically have idealized goals, make personal sacrifices for their principles, and may engage in unconventional behaviour to achieve their goals. (LCF-CF)

coalition

1. An ad hoc agreement between two or more sovereign nations for a common action. (DTB/B-GL-300) 2. A grouping of nations or forces, usually on a temporary basis, for the accomplishment of a stated goal. (JWP0-01)

combat-capable

The state of a force structure and associated equipment that reflects the ability to execute a combat mission. (DPOL)

combat operation

A military operation where the use or threatened use of force, including lethal force, is essential to impose will on an opponent or to accomplish a mission. The actual level of force used will be in accordance with specified rules of engagement. (DTB/B-GL-300) See also *non-combat operation*.

combat search and rescue

A coordinated operation using pre-established procedures for the detection, location, identification and recovery of downed aircrew in hostile territory in crisis or wartime and, when appropriate, isolated personnel in distress, who are trained and equipped to be rescued. (DTB/AAP-6) See also *search and rescue*.

combat service support

The support provided to combat forces, primarily in the fields of administration and logistics. (DTB/AAP-6)

combined

Adjective used to describe activities, operations and organizations, in which elements of more than one nation participate. (DTB/AAP-6) Also called *multinational*. See also *joint*.

command

1. The authority vested in an individual of the armed forces for the direction, coordination, and control of military forces. (DTB/AAP-6) 2. An order given by a commander; that is, the will of the commander expressed for the purpose of bringing about a particular action. (DTB/AAP-6) 3. A unit, or units, an organization, or an area under the command of one individual. (DTB/AAP-6) 4. To exercise a command. (DTB/AAP-6) See also *management*.

Command

One of the four primary organizational elements of the Canadian Force, which includes NDHQ, formations and units. The environmental commands (ECs), Maritime, Land Forces and Air, are considered as the CF equivalents to the separate services (navy, army and air force) found in other defence departments. Also called *environmental commands*. (B-GA-401) See also *formations* and *units*.

command and control

1. The exercise of authority and direction by a properly designated commander over assigned and attached forces in the accomplishment of the mission. The functions of command and control are performed through an arrangement of personnel, equipment, communications, facilities, and procedures employed by a commander in planning, directing, coordinating and controlling forces

in the accomplishment of [the] mission. (DTB/JP 1-02) 2. The process by which commanders plan, direct, control and monitor any operation for which they are responsible. (B-GJ-005)

commander

An individual of the armed forces vested with authority for the direction, coordination, and control of military forces placed under [their] command. (B-GA-401) See also *commanding officer*.

commanding officer

“Commanding officer” means, (a) except when the Chief of the Defence Staff otherwise directs, an officer in command of a base, unit or element, or (b) any other officer designated as a commanding officer by or under the authority of the Chief of the Defence Staff. (QR&O) See also *commander*.

component

1. One of the subordinate organizations that constitute a joint force. Normally a joint force is organized with a combination of service and functional components. (JP 1-02) 2. One of the major constituents of the Canadian Forces. The components of the Canadian Forces are: (a) the Regular Force; (b) Reserve Force; and (c) when established, the Special Force. (QR&O)

component command

1. In the NATO military command structure, a third-level command organization with specific air, maritime or land capabilities. It is responsible for region-wide operational planning and conduct of subordinate operations as directed by the NATO regional commander. Note: its headquarters is distinct from the regional command headquarters. (DTB/AAP-6) 2. A functional component command or service component command responsible for the planning and conduct of a maritime, land, air, special or other operation as part of a joint force. (DTB/AAP-6)

contingency

1. An unforecast or chance situation which may require a military response. (B-GJ-005) 2. An emergency involving military forces caused by natural disasters, terrorists, subversives, or by required military operations. Due to the uncertainty of the situation, contingencies require plans, rapid response, and special procedures to ensure the safety and readiness of personnel, installations, and equipment. (JP 1-02)

contingency operations

1. Those operations dealing with contingency events in support of Canadian interests at home and abroad, requiring the application of military forces or the provision of military assistance. (DPOL) 2. Contingency operations can be conducted in either a domestic or international theatre. If an operation does not fall into the routine category, then it is a contingency operation, and a grouping tailored to the operation is generated. Any grouping created for a contingency operation, regardless of size, is designated a Task Force. (B-GJ-005)

control

1. To dominate, command, regulate; to exert control over. (COD) 2. That authority exercised by a commander over part of the activities of subordinate organizations, or other organizations not normally under [their] command, which encompasses the responsibility for implementing orders or directions. All or part of this authority may be transferred or delegated. (DTB/AAP-6)

counter-air

An air operation directed against the enemy’s air offensive and defensive capability in order to attain and maintain a desired degree of air superiority. (DTB/AAP-6) See also *aerospace control*.

counter-land

Operations conducted to attain and maintain a desired degree of superiority over surface operations by the destruction, disrupting, delaying, diverting, or other neutralization of enemy forces. The main objectives of counter-land operations are to dominate the surface environment and prevent the opponent from doing the same. (AFDD 1-2)

counter-sea

Operations conducted to attain and maintain a desired degree of superiority over maritime operations by the destruction, disrupting, delaying, diverting, or other neutralization of enemy naval forces. The main objectives of counter-sea operations are to dominate the maritime environment and prevent the opponent from doing the same. (AFDD 1-2)

culture

A shared and relatively stable pattern of behaviours, values, and assumptions that a group has learned over time as an effective means of maintaining internal social stability and adapting to its environment, and that are transmitted to new members as the correct ways to perceive, think, and act in relation to these issues. (LCF-CF)

decentralized control

In air defence, the normal mode whereby a higher echelon monitors unit actions, making direct target assignments to units only when necessary to ensure proper fire distribution or to prevent engagement of friendly aircraft. (DTB/AAP-6) See also *centralized control*.

decentralized execution

The delegation of execution authority to subordinate commanders. (JP 1-02)

defence team

The Defence Team is comprised of the civilian employees of the Department and the military members (regular and reserve) of the Canadian Forces. (DPOL)

defensive counter-air

All defensive measures designed to detect, identify, intercept, and destroy or negate enemy forces attempting to attack or penetrate the friendly air environment. Also called DCA. (AFDD 1-2)

deployability

The ability of personnel and materiel to be moved to a theatre of operations. Important considerations include force size, time required to be in theatre, distance of the operational theatre from the normal base of operations and the local considerations in theatre. (DPOL)

deployment operating base

A base, other than the peacetime base, having minimum essential operational and support facilities, to which a unit or part of a unit will deploy to operate from in time of tension or war. (DTB/AAP-6)

direct influence

Face-to-face influence over others which has an immediate effect on their ability, motivation, behaviour, performance, attitudes, or other psychological states, or which progressively modifies such slow-growth attributes as intellectual ability and professional values. (LCF-CF) See *indirect influence*.

discipline

In general, the armed forces' exercise of legal and coercive powers to control the behaviour of members. More particularly, a superior's control of subordinates' conduct to ensure they carry out assigned duties and conform to legal and other professional military norms (e.g., *Code of Service Discipline*). Discipline may be exercised through training, authoritative direction and guidance, supervision, corrective feedback, and punishment if necessary. (LCF-CF) See also *self-discipline*.

distributed leadership

The idea, first, that the capacity for leadership is not limited to people selected for and assigned to senior positions of responsibility and authority but, in varying degrees, is broadly distributed throughout the CF population, and, second, that the function of leadership should be shared. Bringing out this potential requires a combination of broadly based leader-skill development, opportunities for junior leaders to lead and emergent leaders to step forward, professional cohesion

across the leadership team, and a culture that supports and rewards initiative and sensible risk-taking. (LCF-CF) See also *emergent leadership*.

doctrine

Fundamental principles by which the military forces guide their actions in support of objectives. It is authoritative but requires judgment in application. (DTB/AAP-6)

effective CF leadership

The process of directing, motivating, and enabling others to accomplish the mission professionally and ethically, while developing or improving capabilities that contribute to mission success. This definition reflects the idea that leadership roles in the CF exist to serve CF effectiveness. (LCF-CF)

effectiveness

The extent to which stated objectives are achieved. In any definition of effectiveness, the achievement of objectives may be qualified by other criteria, such as efficiency or lawfulness. The CF effectiveness framework adopted for this manual identifies mission success as the primary objective, with member well-being and commitment, internal integration, and external adaptability as enabling or supporting objectives. As to qualifying conditions, the CF concept of effectiveness requires that objectives be achieved in ways that are consistent with the civic, legal, ethical, and military values embraced by the military ethos. (LCF-CF)

emergent leadership

The voluntary assumption of a leadership role by someone who lacks formal responsibility and authority; it is most apparent when a formal authority structure is either lacking or inactive in a group. (LCF-CF) See also *distributed leadership*.

Environmental Chiefs of Staff

Senior (Level 1) advisors to the CDS within the NDHQ structure, double-hatted as Commanders of their respective Maritime, Land Forces and Air environmental command. Also called ECS. (B-GA-401)

environmental doctrine

Doctrine that reflects the three environments in which military operations take place. Sea power, land power and aerospace power have different characteristics and distinct applications and thus each require their own doctrine. In the CF, the Environmental Chiefs of Staff are responsible for the development and maintenance of their respective doctrine. (B-GJ-005)

establishment

1. An installation, together with its personnel and equipment, organized as an operating entity. (DTB/AAP-6) 2. The table setting out the authorized numbers of men and major equipment in a unit/formations; sometimes called table of organization or table of organization and equipment (TO&E). (DTB/AAP-6) See also *peacetime establishment* and *war establishment*.

expeditionary force

An armed force organized to accomplish a specific objective in a foreign country. (JP 1-02)

expeditionary operation

The projection of military power over extended lines of communications into a distant operational area to accomplish a specific objective. (DTB/AAP-6)

force

1. An aggregation of military personnel, weapon systems, vehicles and necessary support, or combination thereof. (JP 1-02) 2. A major subdivision of a fleet. (JP 1-02)

force development

Planning and conceptualizing associated with the creation, maintenance and adaptation of military capabilities in the face of changing security and resource circumstances. Ideally, force development

should be holistic, that is, encompass the entire range of considerations associated with creating, maintaining and adapting military capability. (SCP)

force employment

1. The process of exercising command and control of forces tasked to carry out operations in accordance with defence policy and strategic direction. (MCCRT) 2. All activities required to plan, conduct and review CF operations. The activities inherent to the FE process are independent of organization or command level. (B-GJ-005)

force generation

1. The process of transforming strategic and corporate policy into forces for employment. (MCCRT) 2. The process of bringing forces, or part of them, to a state of readiness for operations, by assembling, and organizing personnel, supplies, and materiel. This task includes the training and equipping of forces and the provision of their means of deployment, sustainment and recovery to meet all current and potential threats. (SCP)

force planning

Planning associated with the creation and maintenance of military capabilities. (JP 1-02)

force protection

Force protection encompasses the means, resources and measures available to a commander for the protection of operations, activities, establishments, personnel, information and materiel. The principal components of force protection are: counter-intelligence, counter-terrorism, protective security; and military police operations. (B-GJ-005)

force structure

1. The composition of the forces in terms of types of formations and units and their equipment together with their relationship to one another. (DPOL) 2. A general term to describe the broad elements of an actual or proposed military force. Detailed force structures describe the organization and equipment of a military, while more general force structure descriptions focus on the overall nature of the force. For example, some force structures are designed for specific circumstances, while others are designed for a variety of possibilities and may therefore be described as multi-purpose. (SCP)

formation

1. An ordered arrangement of troops and/or vehicles for a specific purpose. (DTB/AAP-6) 2. An ordered arrangement of two or more ships, units, or aircraft proceeding together under a commander. (DTB/AAP-6) 3. An element of the Canadian Forces, other than a command, comprising two or more units designated as a formation by or on behalf of the Minister and grouped under a single commander. (QR&O) See also *air division*, *air group* and *Command*.

forward operating base

An airfield used to support tactical operations without establishing full support facilities. The base may be used for an extended time period. Support by a main operating base will be required to provide backup support for a forward operating base. Also called FOB. (JP 1-02)

forward operating location

1. Designated airfield at which dedicated facilities are maintained to support periodic tactical fighter operations. (DTB) 2. Similar to a forward operating base (FOB) but without the in-place infrastructure associated with a FOB. Primarily used for counter-drug operations. Also called FOL. (JP 1-02)

full command

The military authority and responsibility of a commander to issue orders to subordinates. It covers every aspect of military operations and administration and exists only within national services. (AAP-6)

heroic leadership

Conspicuous sharing of risk with subordinates. (Chapter 5) See also *technical leadership*.

indirect influence

Influence over others that is mediated by purposeful alterations in the task, group, system, institutional, or environmental conditions that affect behaviour and performance. (LCF-CF) See also *direct influence*.

interoperability

The ability of alliance forces and, when appropriate, forces of partner and other nations to train, exercise, and operate effectively together in the execution of assigned missions and tasks. (DTB/AAP-6)

joint

Adjective used to describe activities, operations and organizations in which elements of at least two services participate. Also called “multi-service.” (When not all services are involved, the participating services shall be identified, e.g., Joint army-navy.) (DTB/AAP-6) See also *combined*.

joint air operations

Air operations performed with air capabilities/forces made available by components in support of the joint force commander’s operation or campaign objectives, or in support of other components of the joint force. (JP 1-02)

joint doctrine

Fundamental principles that guide the employment of forces of two or more ECs/services in coordinated action toward a common objective. It is authoritative; as such, joint doctrine will be followed except when, in the judgment of the commander, exceptional circumstances dictate otherwise. (B-GA-401)

joint force air component commander

A commander, designated by the JFC or higher authority, responsible for making recommendations to the JFC on the proper employment of assigned, attached, and/or made available for tasking air forces; planning and coordinating air operations; or accomplishing such operational missions as may be assigned. The joint force air component commander is given the authority necessary to accomplish missions and tasks assigned by the establishing commander. Also called JFACC. (AJP-01)

joint force commander

A general term applied to a commander authorized to exercise combatant authority or operational control over a joint force. Also called JFC. (AJP-01)

leadership

The process 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. (LCF-CF)

leading people

One of two major leadership functions in the CF, primarily concerned with developing individual, team, and unit capabilities and using those capabilities to execute tasks and missions. (LCF-CF)

leading the institution

One of two major leadership functions in the CF, primarily concerned with developing and maintaining the CF’s strategic and professional capabilities and creating the conditions for operational success. (LCF-CF)

learning organization

An organization that is able, on an ongoing basis, to critically examine its performance, assimilate information from the environment, and transform itself, with a view to adapting to challenges and positioning itself to exploit opportunities or to establish a dominant capability. (LCF-CF)

levels of aircraft maintenance

Term which describes the depth of maintenance being undertaken on an aircraft or component. There are three levels of maintenance: Level One (1st Level)—normally includes all servicing and corrective/preventive maintenance that can be accomplished without major disassembly of the aircraft; Level Two (2nd Level)—primarily addresses aircraft or component maintenance activities that must be carried out under controlled conditions often with specific access to test equipment or facilities (shops, hangars, environmental controls); and Level Three (3rd level)—encompasses more extensive activities such as replacement or restoration of major parts, assemblies or components, rebuilding and overhaul of equipment, mid-life improvements, life extension programs and more lengthy activities that require specialized facilities beyond those normally available at a wing. (B-GA-401) See also *maintenance*.

levels of conflict

A general framework for the command and control of operations and the analysis of civil and military functions that distinguishes among activities at the national-strategic level (concerned with broad national interests), the military-strategic level (concerned with the allocation of military capabilities in support of the national strategy), the operational level (concerned with the planning and conduct of campaigns to achieve military-strategic objectives), and the tactical level (concerned with the conduct of battles and engagements to achieve operational objectives). (LCF-CF)

levels of warfare

The recognized levels of warfare, from which the levels for the planning and command of operations are derived. They are: grand strategic, military strategic, operational and tactical. Also known as *levels of war*. (JWP 0-01)

logistics

The science of planning and carrying out the movement and maintenance of forces. In its most comprehensive sense, those aspects of military operations which deal with: (a) design and development, acquisition, storage, movement, distribution, maintenance, evacuation, and disposition of materiel; (b) movement, evacuation, and hospitalization of personnel; (c) acquisition or construction, maintenance, operation, and disposition of facilities; (d) acquisition or furnishing of services; and (e) medical and health service support. (DTB/AAP-6)

logistics support

All activities which support the movement, maintenance and administration of aerospace forces and personnel. (B-GA-400)

main aerodrome/airfield

Aerodrome designed for permanent occupation in peacetime, also suitable for use in wartime and having sufficient operational facilities for full use of its combat potential. Also referred to as *main operating base* (MOB). (DTB/AAP-6)

maintenance

1. All actions taken to retain equipment in or to restore it to a specified condition, including inspection, testing, servicing, classification as to serviceability, repair, rebuilding and reclamation. (DTB/AAP-6) 2. All supply and repair action taken to keep a force in condition to carry out its mission. (DTB/AAP-6) 3. The routine recurring work required to keep a facility (plant, building, structure, ground facility, utility system, or other real property) in such condition that it may be continuously utilized, at its original or designed capacity and efficiency, for its intended purpose. (DTB/AAP-6) See also *levels of aircraft maintenance*.

management

The authority-based process of planning, organizing, leading, and controlling the efforts of organizational members and the use of other organizational resources to achieve organizational goals. (LCF-CF) See also *command*.

military service

A branch of the Armed Forces of the nation, established by act of Parliament, in which persons are appointed, enlisted, or inducted for military service, and which operates and is administered within a military or other government department. The principal military services are: the Navy, the Army, and the Air Force. The Coast Guard and a Marine Corps may also be established as military services. (B-GA-401)

military strategic level

The military strategic level is concerned with determining the military strategic objectives and desired end state, outlining military action needed, allocating resources and applying constraints directed by political leaders. (SCP)

military strategy

That component of national or multi-national strategy that presents the manner in which military power should be developed and applied to achieve national objectives or those of a group of nations. (DTB/AAP-6) See also *national military strategy*, *national strategy*, and *strategy*.

mission

1. A clear, concise statement of the task of the command and its purpose (DTB/AAP-6) 2. One or more aircraft ordered to accomplish one particular task. (AAP-6)

mission command

The CF philosophy of command, which basically relies on a clear understanding of the commander's intent to co-ordinate the actions of subordinate commanders and which thereby allows them maximum of freedom of action in how they accomplish their missions. Mission command has its origins in the German Army concept of *Auftragstaktik*, and is often contrasted with a command style which relies more on procedural direction and control. (LCF-CF)

mobilization

1. The act of preparing for war or other emergencies through assembling and organizing national resources. (DTB/AAP-6) 2. The process by which the armed forces or part of them are brought to a state of readiness for war or other national emergency. This includes assembling and organizing personnel, supplies and materiel for active service. (DTB/AAP-6)

motivation

An internal energizing state that may be triggered by physiological or psychological needs, the creation or failure of expectations, or emotional arousal. Motivation cannot be observed directly but is usually inferred from one or more behaviours: the choices an individual makes when presented with alternatives, the level of effort expended in performing a task, or the persistence of effort over time or in the face of difficulties. (LCF-CF)

national commander

1. A national commander, territorial or functional, who is normally not in the allied chain of command. (DTB/AAP-6) 2. A commander who has national responsibilities. For large-scale commitments of CF elements, the national commander will not normally be part of the alliance or coalition chain of command, but will represent national interests and concerns to the coalition commander. For smaller scale operations, the national commander may be part of the chain of command. (B-GJ-005)

national military authority

The government agency, such as a Ministry of Defence or Service Ministry, empowered to make decisions on military matters on behalf of its country. (DTB/AAP-6)

national military strategy

The art and science of distributing and applying military power to attain national objectives in peace and war. (JP 1-02) See also *military strategy*.

national objectives

The aims, derived from national goals and interests, toward which a national policy or strategy is directed and efforts and resources of the nation are applied. (These may be short-, mid-, or long-range in nature.) (JP 1-02)

national policy

A broad course of action or statements of guidance adopted by the government at the national level in pursuit of national objectives. (JP 1-02) See also *policy*.

national security

1. A collective term encompassing both national defence and foreign relations. Specifically, the condition provided by: a. a military or defence advantage over any foreign nation or group of nations; b. a favourable foreign relations position; or c. a defence posture capable of successfully resisting hostile or destructive action from within or without, overt or covert. (JP 1-02) 2. The protection of a nation from all types of external aggression, espionage, hostile reconnaissance, sabotage, subversion, annoyance, and other inimical influences. (B-GA-401)

national security interests

The foundation for the development of valid national objectives that define national goals or purposes. National security interests include: preserving political identity, framework, and institutions; fostering economic well being; and bolstering international order supporting the vital interests of the nation and its allies. (JP 1-02)

national security strategy

The art and science of developing, applying, and coordinating the instruments of national power (diplomatic, economic, military, and informational) to achieve objectives that contribute to national security. Also called *national strategy* or *grand strategy*. (JP 1-02)

national strategy

1. The application and coordination of all elements of national power—economic, diplomatic, psychological and military. It strives to attain the objectives of government policy in peace as in conflict. (B-GJ-005) 2. The art and science of developing and using the political, economic, and psychological powers of a nation, together with its armed forces, during peace and war, to secure national objectives. (JP 1-02) See also *military strategy and strategy*.

non-combat operation

Military operation where weapons may be present, but their use or threatened use is for self-protection purposes and not otherwise essential to the accomplishment of the mission. (B-GL-300) See also *combat operation*.

norms

Shared beliefs and expectations about what behaviours are appropriate for members of a group. (LCF-CF)

offensive counter-air

Offensive operations to destroy, disrupt, or neutralize enemy aircraft, missiles, launch platforms, and their supporting structures and systems both before and after launch, but as close to their source as possible. Offensive counter-air operations range throughout enemy territory and are generally conducted at the initiative of friendly forces. These operations include attack operations, fighter sweep, escort, and suppression of enemy air defences. Also called OCA. (AFDD 1-2)

OODA loop

A theory developed by Col. John Boyd (USAF, Ret.) contending that one can depict all rational human behaviour, individual and organizational, as a continual cycling through four distinct tasks: observation, orientation, decision, and action. (AFDD 1-2)

operation

1. A military action or the carrying out of a strategic, operational, tactical, service, training, or administrative military mission. (DTB/AAP-6) 2. The process of carrying on combat, including movement, supply, attack, defence and manoeuvres needed to gain the objectives of any battle or campaign. (DTB/AAP-6) 3. The deployment of an element or elements of the CF to perform a specific mission. (B-GJ-005) See also *aerospace operation*.

operational aerospace doctrine

Fundamental principles which guide the organization and employment of aerospace forces across the spectrum of conflict at the operational level. (B-GA-401)

operational art

The skill of employing military forces to attain strategic objectives in a theatre of war or theatre of operations through the design, organization and conduct of campaigns and major operations. (Operational art translates the joint force commander's strategy into operational design, and, ultimately, tactical action, by integrating the key activities at all levels of war). (B-GJ-005)

operational command

The authority granted to a commander to assign missions or tasks to subordinate commanders, to deploy units, to reassign forces and to retain or delegate operational and/or tactical control as may be deemed necessary. It does not of itself include responsibility for administration. (DTB/AAP-6)

operational level of war

The level of war at which campaigns and major operations are planned, conducted, and sustained to accomplish strategic objectives within theatres or areas of operations. (DTB/AAP-6)

operational training

Training that develops, maintains, or improves the operational readiness of individuals or units. (JP 1-02, DTB/AAP-6)

operations support

All activities which directly and indirectly assist in the planning and execution of air operations. (B-GA-400)

organizational functions

The range of activities that provide the institutional infrastructure underpinning of a modern air force. These include such activities as accessions, training, and education; research, development, and acquisition; budget preparation and submission; general administration; logistics support; conducting operational testing and evaluation; determining Service force requirements and making recommendations concerning force requirements to support national security objectives; as well as operating vehicles, systems, and craft. Many of these activities directly relate to the "organize, train, and equip" responsibilities assigned to each Service. (AFDD-1)

peacetime establishment

A table setting out the authorized peacetime manpower requirement for a unit, formation or headquarters. Also called *peacetime complement*. (DTB/AAP-6) See also *establishment* and *war establishment*.

personal power

The capacity or potential to influence others on the basis of personal characteristics and attributes. These include expert power, referent power, and connection power. (LCF-CF)

personnel tempo

The frequency and quantity of time spent on military duties away from home. Also called PERSTEMPO. (DTB)

policy

Course or general plan of action to be adopted by government, party, etc. (COD) See also *national policy*.

position power

The capacity or potential to influence others on the basis of authorities conferred by organizational position or rank. These include legitimate power, reward power, coercive power, information power, and ecological power. (LCF-CF)

professionalism

In general, displaying the qualities or features of a profession. With respect to the CF, professionalism means that CF members apply their unique body of military expertise in accordance with the civic, legal, ethical, and military values of the military ethos, pursuant to the profession's responsibility to society and a strong personal identification with military activities and the military way of life. (LCF-CF)

readiness

The level of preparedness (materiel, personnel) to respond to the risk described in a scenario or to an actual emergent operation. A state of readiness can be increased over time through recruiting, training or increased materiel capability. A reduced state of readiness is maintained to reduce the wear and tear on personnel and equipment and to reduce costs. Applicable readiness states are: High, Normal, Reduced, and Mobilization. (DPOL)

readiness state

1. The measure of the capability of forces at a given point in time to execute their assigned missions. (DTB/AAP-6) 2. Identifies the overall operational capability required to perform a task, and is assigned to a unit or formation by the responsible commander using the five components of personnel, equipment, training, service support and command and control. (DPOL)

resilience

The individual and collective ability to recover from surprise, setbacks, miscarried plans, and other threats to mission accomplishment. (LCF-CF)

resistance

Behaviour that passively or actively opposes the wishes of another. (LCF-CF)

responsibility

Something that one is required to do as part of a job, role, or legal obligation; having the authority and obligation to act. (LCF-CF) See also *accountability*.

risk

Any circumstance which exposes a decision maker or course of action to some hazard which may either produce a negative effect or else prevent or impede the attainment of one or more objectives. (LCF-CF)

risk management

A systematic approach for determining the best course of action and mitigating risk when risks are present. Risk management involves identifying, understanding, assessing, and acting on risk according to its likelihood and potential impact. (LCF-CF)

role

What a person or thing is appointed or expected to do. (COD)

routine operation

Those operations for which a given Capability Component (CC) has been specifically tasked, organized and equipped. Routine operations use existing command and control relationships, and there is no requirement to use joint terminology. (B-GJ-005)

rules of engagement

1. Directives issued by competent military authority which specify the circumstances and limitations under which forces will initiate and/or continue combat engagement with other forces encountered. (DTB/AAP-6) 2. Directions issued by competent military authority which delineate the circumstances and limitations within which armed force may be applied to achieve military objectives in furtherance of national policy. (B-GJ-005)

search and rescue

The use of aircraft, surface craft (land or water), submarines, specialized rescue teams, and equipment to search for and rescue personnel in distress on land or at sea. Also called SAR. (DTB/AAP-6) See also *combat search and rescue*.

self-discipline

The ability of a military member, independently of external supervision and control, to direct and regulate his or her behaviour and perform his or her duties in accordance with internalized professional values and norms. (LCF-CF) See also *discipline*.

situational awareness

The combined knowledge of friendly forces, hostile forces, the environment and other aspects of the battlespace. (DTB)

space environment

The region beginning at the lower boundary of the Earth's ionosphere (approximately 50 km) and extending outward that contains solid particles (asteroids and meteoroids), energetic charged particles (ions, protons, electrons, etc.), and electromagnetic and ionizing radiation (x-rays, extreme ultraviolet, gamma rays, etc.). (JP 1-02)

socialization

The formal and informal processes of teaching and persuading others to accept the core beliefs, values, behavioural norms, and roles of a particular culture. (LCF-CF)

squadron

The basic air force organizational unit whose role includes the operation of aircraft or the provision of direct support to aircraft operations. (B-GA-401)

strategic aerospace doctrine

The most fundamental and enduring principles which guide the use of national aerospace forces in military action. Strategic aerospace doctrine establishes the framework for the effective application of aerospace power in the national context, and provides the foundation for all CF aerospace doctrine. (B-GA-401)

strategic air warfare

Air operations designed to effect the progressive destruction and disintegration of the enemy's war-making capacity. (DTB/AAP-6) Also referred to as *strategic attack* by the USAF.

strategic attack

Military action carried out against an enemy's center(s) of gravity or other vital target sets including command elements, war production assets, and key supporting infrastructure in order to effect a level of destruction and disintegration of the enemy's military capacity to the point where the enemy no longer retains the ability or will to wage war or carry out aggressive activity. (AFDD-1)

strategic level of war

The level of war at which a nation or group of nations determines national or multinational security objectives and deploys national, including military, resources to achieve them. (DTB/AAP-6)

strategy

1. The application of national (political, economic, social technological, psychological and military) resources to achieve national policy objectives and to promote or protect national interests in peace, conflict and war. (B-GL-300) 2. The art of creating a desired pattern to events, where the ends and ways and means of achieving them may be brought into balance within the prevailing environment. (JWP0-01) 3. The art and science of developing and employing instruments of national power in a synchronized and integrated fashion to achieve theatre, national, and/or multinational objectives. (JP 1-02) See also *military strategy* and *national strategy*.

support

1. The action of a force, or portion thereof, which aids, protects, complements, or sustains any other force. (DTB/AAP-6) 2. The action of a force that aids, protects, complements, or sustains another force in accordance with a directive requiring such action. (JP 1-02) 3. A unit that helps another unit in battle. (JP 1-02) 4. An element of a command that assists, protects, or supplies other forces in combat. (JP 1-02) See also *sustainment*.

supported commander

A commander having primary responsibility for all aspects of a task assigned by a higher NATO military authority and who receives forces or other support from one or more supporting commanders. (DTB/AAP-6) See also *supporting commander*.

supporting commander

A commander who provides a supported commander with forces or other support and/or who develops a supporting plan. (DTB/AAP-6) See also *supported commander*.

sustainment

The requirement for a military force to maintain its operational capability for the duration required to achieve its objectives. Sustainment consists of the continued supply of consumables, and the replacement of combat losses and non-combat attrition of equipment and personnel. (B-GJ-005, DPOL) See also *support*.

tactical aerospace doctrine

The fundamental beliefs that guide the effective employment of aerospace weapons systems at the tactical level. (B-GA-401)

tactical level of war

The level of war at which battles and engagements are planned and executed to accomplish military objectives assigned to tactical units or task forces. (DTB/AAP-6)

task

1. An activity which contributes to the achievement of a mission. (DTB) 2. A discrete event or action, not specific to a single unit, weapon system, or individual, that enables a mission or function to be accomplished—by individuals or organizations. (AFDD 1-2)

task force

1. A temporary grouping of units, under one commander, formed for the purpose of carrying out a specific operation or mission. (DTB/AAP-6) 2. Semi-permanent organization of units, under one commander, formed for the purpose of carrying out a continuing specific task. Also called TF. (DTB/AAP-6) See also *aerospace expeditionary task force* and *unit*.

technical leadership

The ability to influence others to achieve a goal based on the specialized knowledge or skill of the leader. (Chapter 5) See also *heroic leadership*.

total force

A concept that integrated full- and part-time military personnel to provide multi-purpose, combat-capable armed forces. (TAF)

transactional leadership

A general pattern of influence based on the provision of various rewards or benefits in exchange for extra effort or improved performance; sometimes discussed with reference to principles of economic exchange. (LCF-CF)

transformation

A fundamental change in what the organization is able to do, and how it does it. Military transformation is more than merely modernizing or reorganizing forces in an existing structure. It also means changing the way the military perceives and thinks, its management structures and decision-making processes, and its force structure. (B-GA-401)

transformational leadership

A general pattern of influence based on shared core values and mutual commitment and trust between the leader and led, and intended to effect significant or radical improvement in individual, group, or system capabilities and performance; sometimes discussed in the context of social-exchange theory. (LCF-CF)

trust

The willingness to accept the decisions or influence of another person based on a belief in that person's reliability. Any of several characteristics may be important to establishing reliability, including technical competence, loyalty, integrity, courage, and similar qualities. (LCF-CF)

unit

1. A military element whose structure is prescribed by a competent authority. (DTB/AAP-6) 2. A standard or basic quantity into which an item of supply is divided, issued, or used. (DTB/AAP-6) 3. An individual body of the Canadian Forces that is organized as such pursuant to Section 17 of the National Defence Act, with the personnel and material thereof. (QR&O) See also *Command* and *task force*.

unit climate

In a unit, members' perceptions of their work environment. Major climate dimensions include: role stress and clarity, job challenge and autonomy, supportive and facilitative leader behaviour, and work-group co-operation and friendliness. (LCF-CF)

values

Beliefs concerning what is centrally important in life and what should, therefore, guide decisions and actions; properties or qualities that make something useful, desired, or esteemed. (LCF-CF)

war

1. The most extreme manifestation of armed conflict, characterized by intensive, extensive and sustained combat, usually between states. (JWP 0-01) 2. Open and often prolonged conflict between nations (or organized groups within nations) to achieve national objectives. (AFDD 1-2)

war establishment

The personnel, major equipment and organization authorized for a unit or formation to perform its role in war. (DTB) See also *establishment* and *peacetime establishment*.

wing

The basic air force organizational formation capable of sustained and independent operation. It normally consists of two or more squadrons, along with the necessary supporting organizations, which have similar roles and/or employ similar aircraft. (B-GA-401)

Abbreviations

1 CAD	1 Canadian Air Division
1 CAG	1 Canadian Air Group
1 Cdn Air Div	1 Canadian Air Division
1 FTTE	1 Field Technical Training Establishment
10 TAG	10 Tactical Air Group
3D	defence, diplomacy and development
4 ATAF	Fourth Allied Tactical Air Force
4 CFMCU	4 Canadian Forces Movement Control Unit
4GW	Fourth Generation Warfare
8 ACCS	8 Air Communication and Control Squadron
A/G/A	air-ground-air
A/V/M	Air Vice-Marshal
AAR	Air-to-Air Refuelling
ACAG	Aerospace Control Advisory Group
ACC	Air Component Commander
ACMI	Air Combat Manoeuvring Instrumentation
ACS	aircraft structures
ACSAG	Air Combat Support Advisory Group
ACSS	Air Combat Service Support
ADC	Air Defence Command
ADG	Air Defence Group
ADM	Assistant Deputy Minister
ADM (HR-Mil)	ADM Human Resources Military
ADM (Mat)	Assistant Deputy Minister (Materiel)
ADM (Fin CS)	ADM Financial and Corporate Services
ADR	Airfield Damage Repair
AE	Airfield Engineering
AEF	Airfield Engineering Flight
AERE	aerospace engineering
AES Ops	airborne electronic sensor operators
AES	Airfield Engineering Squadron
AETE	Aerospace Engineering Test Establishment
AEU	Air Expeditionary Unit
AFCCRT	Air Force Command and Control Reengineering Team
AFCF	Air Force Capability Framework
AFMS	Aircraft Field Maintenance Squadron
AFOAC	Air Force Officers Advanced Course
AFOBC	Air Force Officers Basic Course
AFP	Air Force Police
AFSC	Air Force Support Capability
AGOS	Air Group Operations School
AIRCOM	Air Command
Air Mov	Air Movements
ALCE	Air Lift Control Element(s)
ALOC	Advanced Logistics Officers Course
AMAG	Air Mobility Advisory Group
AMC	Air Materiel Command
AMS	Air Maintenance Squadron or Air Movement Squadron
AMSC	Advanced Military Studies Course
AMSE	aircraft maintenance support equipment

AOC	Air Officer Commanding or Air Operations Centre
AOC MAC	Air Officer Commanding Maritime Air Command
AOCCIS	Air Operations Command and Control Information Systems
AOP	Air Observation Post
AOR	Auxiliary Oiler Replenishment or Area of Responsibility
ARAF	Air Reserve Augmentation Flight
ARAG	Air Reserve Advisory Group
ARFF	Aircraft Rescue and Fire-Fighting
ARG	Air Reserve Group
ASF	Airfield Security Force
ASO	Air Staff Officer or Acoustic Sensor Operator
ASU Flt	Airfield Systems and Utilities Flight
ASW	anti-submarine warfare
ATC	Air Transport Command
ATESS	Aerospace and Telecommunications Engineering Support Sqdn
ATG	Air Transport Group
ATIS Tech	Aerospace Telecommunications and Information Systems Technician(s)
ATO	Air Tasking Order
ATOC – CSS	Army Tactical Operations Course – Combat Service Support
AVN	aviation
AVS	avionics
BCATP	British Commonwealth Air Training Plan
BCE	Balanced Command Envelope
BComd	Base Commander
BOTC	Basic Officer Training Course
BTSO	Base Technical Services Officer
C Cap	Contingency Capability
C&E	Communications and Electronics
C2	command and control
C2IS	Command and Control Information Systems
CAC	Canadian Aviation Corps
CAF	Canadian Air Force
CAG	Capability Advisory Group
Canada COM	Canada Command
CANOSCOM	Canadian Operational Support Command
CANR	Canadian NORAD Region
CANSOFCOM	Canadian Special Operations Force Command
CAR	competency, authority and responsibility
CAS	Chief of the Air Staff
CBRN	chemical, biological, radiological, nuclear
CC3	Capability Component 3
CCC	Contingency Capability Centre
CCompt	Command Comptroller
CDS	Chief of the Defence Staff
CEF	Canadian Expeditionary Force
CEFCOM	Canadian Expeditionary Force Command
CELE (Air)	Communications and Electronics Engineering (Air)
CF	Canadian Forces
CFACC	Combined Force Air Component Commander
CAWC	Canadian Forces Aerospace Warfare Center
CFC	Canadian Forces College

CFHQ	Canadian Forces Headquarters
CFMWC	Canadian Forces Maritime Warfare Centre
CFNIS	Canadian Forces National Investigation Service
CFOOs	Canadian Forces Organization Orders
CFSAL	Canadian Forces School of Administration and Logistics
CFSATE	Canadian Forces School of Aerospace Technology and Engineering
CFSIS	Canadian Forces School of Intelligence and Security
CIBG	Canadian Infantry Brigade Group
CIMIC	civilian-military cooperation
CINC or C-in-C	Commander-in-Chief
CIS	Communications and Information Services
CLFSC	Canadian Land Forces Command and Staff College
CME	Canadian Military Engineering
CO	Commanding Officer
Comd	Commander
COMSEC/ITSEC	Communication/Information Technology Security
COS	Chief of Staff
COS OPS	Chief of Staff Operations
COS Pers	Chief of Staff Personnel
COS SUP	Chief of Staff Support
COS T&R	Chief of Staff Training and Reserves
CPG	CAS Planning Guidance
CSC	Command and Staff Course
CSG	Canadian Support Group
CVBG	Carrier Battle Groups
DCGAO	Directorate of Civil Government Air Operations
DComd Msn Sp and Trg	Deputy Commander Mission Support and Training
DDE	escorts destroyer
DDH	helicopter-carrying destroyer
Det	detachment
DEU	Distinctive Environmental Uniform
DGAEPM	Director General Air Equipment Program Management
DGAF	Director General Air Forces
DGI	Director General Intelligence
DMOS	Director Military Occupational Structures
DOB	Deployed Operating Base
DOT	Department of Transport
DP	Development Period
DPS	Defence Policy Statement
DRDC	Defence Research and Development Canada
EBO	Effects Based Operations
ECs	environmental commands
EMA	Escadron de maintenance – Air
EME	Electrical and Mechanical Engineering
EO	explosive ordnance
EO/IR	electro-optical/infra-red
EOD	Explosive Ordnance Disposal
ERS	Emergency Response Services
ETAH	Escadron Tactique d’Helicopteres
F&E	Furniture and Effects
FCAG	Fighter Capability Advisory Group

FCS	Fire Control Systems
Flt	flight
FMAS	Financial Management and Accounting System
FMC	Force Mobile Command
FOAC	Flag Officer Atlantic Coast
FOL	Forward Operating Locations
Food Svcs O	Food Services Officer
FP	Force Protection
FTTS	Field Technical Training Sqn
FTTU	Field Technical Training Unit
GS	General Support
HelAirDet	Helicopter Air Detachment
HOTEF	Helicopter Operational Test and Evaluation Facility
HQ	headquarters
HR	Human Resources
HS	Helicopter Anti-submarine Squadron
HTP	Helicopter Transport Platoon
HWE	Home War Establishment
IED	improvised explosive devices
IFR	Instrument Flight Rules
IOC	initial operating capability
ISR	intelligence, surveillance and reconnaissance
IT	Information Technology
JATS	Joint Air Training School
JFACC	Joint Force Air Component Commander
JIATF	Joint Interagency Task Force
JIMP	Joint, Interagency, Multinational, and Public
JSG	Joint Support Group
JTFA	Joint Task Force Atlantic
LATEF	Land Aviation Test and Evaluation Flight
LCC	Land Component Commander
LMF	lack of moral fibre
LOCC	Logistics Officer Course Common
Log	Logistics
LORE	Land Ordnance Engineering
LRP	Long Range Patrol
LRPA	Long Range Patrol Aircraft
LRP Det	Long Range Patrol Detachment
MA	Management Authority
MAAG	Maritime Air Advisory Group
MAC (A)	Maritime Air Component Atlantic
MAG	Maritime Air Group
MAMS	Mobile Air Movements Sections
MARCOM	Maritime Command
MASOP	Materiel Acquisition and Support Optimization Project
MCCRT	Management Command and Control Re-engineering Team
MDC	Materiel Distribution Centre
MH	Maritime Helicopter
MHCC	Maritime Helicopter Crew Commander
MIO	Maritime Interdiction Operations
MIP	Master Implementation Plan
MND	Minister of National Defence

MO	Medical Officer
MOB	Main Operating Base
MOBCOM	Mobile Command
MOC	Military Occupation Code
MOSART	Military Occupational Structure Analysis, Redesign and Tailoring
MOSID	Military Occupation Structure Identification
MP	Military Policing or Military Police
MPCC	Maritime Patrol Crew Commander
MPEU	Maritime Proving and Evaluation Unit
MSE Ops	MSE Operators
MSE	Mobile Support Equipment
MSS	Mission Support Squadron
MSU	Mission Support Unit
NATO	North Atlantic Treaty Organization
NavCom	Navigator Communications
NBC	nuclear, biological and chemical
NCCIS	National Command and Control Information System
NCM	Non-Commissioned Members
NCW	Network-Centric Warfare
NDHQ	National Defence Headquarters
NDT	Non-Destructive Testing
NEOps	Network Enabled Operations
NMDS	National Material Distribution System
NORAD	North American Air Defence Command
NPAAF	Non-Permanent Active Air Force
NSE	National Support Element
NSSC	National Securities Studies Course
NVGs	night vision goggles
OC	officer commanding
OGDs	other government departments
OIF	Operation IRAQI FREEDOM
OODA	Observe, Orient, Decide, Act
OP	operation
OPCON	operational control
OPSEC	operational security
OP TASK AIR	operational air tasking order
OWE	Overseas War Establishment
PAAF	Permanent Active Air Force
PFAO	Public Fund Accounting Officers
PM	Provost Marshal
PME	Professional Military Education
PPT	practical phase training
PUKS	Pack-up kits
RACE	Regional Air Component Commander
RAF	Royal Air Force
RCAF	Royal Canadian Air Force
RCASC	Royal Canadian Army Service Corps
RCD	Royal Canadian Dragoons
RCEME	Royal Canadian Electrical Mechanical Engineering
RCMP	Royal Canadian Mounted Police
RCN	Royal Canadian Navy
RCOC	Royal Canadian Ordnance Corps

RDO	Rapid Decisive Operations
RFC	Royal Flying Corps
RMA	Revolution in Military Affairs
RMP	recognized maritime picture
RMS	Resource Management Support
RN	Royal Navy
RNAS	Royal Naval Air Service
ROE	rules of engagement
SAGE	Semi-Automatic Ground Environment
SAMA	Senior Aircraft Maintenance Authority
SAMEO	Squadron Aircraft Maintenance Officer
SAO	Supply Administration Officer
SAR	search and rescue
SAT	Strategic Airlift
SC	standard commercial
SCTF	Standing Contingency Task Force
SERT	Special Emergency Response Team
SES	Software Engineering Squadron
SHAPE	Supreme Headquarters Allied Powers Europe
SIU	Special Investigation Unit
SMP	standard military pattern
SOF	special operations forces
SOP	Standard Operating Procedure
SOR	Statement of Requirements
Sp CAG	Support Capability Advisory Group
Sqn	squadron
SSO	senior staff officer
STANAVFORLANT	Standing Naval Force Atlantic
SWE	Salary Wage Envelope
Tac Avn	Tactical Aviation
TacNav	tactical navigator
TAF	tactical air force
TASS	Tactical Aviation Support Squadron
TAT	Tactical Airlift
TAvnAG	Tactical Aviation Advisory Group
TAW	Tactical Aviation Wing
TEME	Transportation and Electrical and Mechanical Engineering
TES	trained effective strength
Tfc Tech	Traffic Technician
TG Air O	Task Group Air Officer
TIS	Telecommunications and Information Services
TrgAG	Training Advisory Group
TSSU	Tactically Self-Sufficient Unit
TTF	Technical Training Flight
UAV	unmanned aerial vehicle
UXB	unexploded bombs
UXO	unexploded ordnance
VCDS	Vice Chief of the Defence Staff
VVIP	Very Very Important Person
W Adm O	Wing Administration Officer
W CIO	Wing Chief Information Officer
W Compt	Wing Comptroller

W Log O	Wing Logistics Officer
W Ops O	Wing Operations Officer
W Sup	Wing Supply
W TEME	Wing Transportation and Electrical and Mechanical Engineering
W Tn O	Wing Transportation Officer
WCE	Wing Construction Engineering
WComd	Wing Commander
WTIS	Wing Telecommunications and Information Services
WTISO	Wing Telecommunications and Information Services Officer

Selected Bibliography on the Canadian Air Force Leadership

Note: Call #s refer to documents in the Canadian Forces College (CFC) library unless otherwise noted.

“Air Force officer professional development” [a compilation of papers and minutes relating to Air Force officer development in the CF]. [s.l. : s.n.], 1988. Call #: 355/.3320971/A58.

Akitt, Brian. “The Sea King replacement project : a lesson in failed civil-military relations.” National Security Studies Course (NSSC) papers, wps.cfc.dnd.ca/papers/nssc/nssc4/akitt2.pdf.

Allan, Stephen. “Canadian Forces Rotary Wing Force Restructure.” Paper written for Command and Staff Course 27 wps.cfc.dnd.ca/papers/csc/csc27/allan.pdf.

Annis, Clare L. “The roles of the air forces : address delivered before the Montreal United Services Institute, February 21st, 1952.” [S.l. : s.n., 1952?] Call #: 358/.400971/A55.

-----, “The significance to air defence of some recent technical trends : address ... to the Montreal Air Force Veterans’ Association on 12th November, 1954.” Ottawa : Air Defence Command, RCAF, 1954. Call #: 358.400971 A5 1954.

Babcock, Sandy. “Air Marshal Roy Slemon: The RCAF’s Original.” In Bernd Horn and Stephen Harris, eds. *Warrior Chiefs: Perspectives on Senior Canadian Military Leadership*. Toronto: Dundurn Press, 2001, 257-84.

-----, “Withered on the Vine: The Postwar RCAF Auxiliary.” In Tremblay, Yves ed. *Canadian Military History Since the 17th Century* [Ottawa, DND: Directorate of History and Heritage], 395-404. Available at www.forces.gc.ca/hr/dhh/publications/engraph/Online_e.asp?cat=6.

Bashow, David L., et al. “Mission Ready: Canada’s Role in the Kosovo Air Campaign.” *Canadian Military Journal* 1, no. 1 (Spring 2000), 55-66.

Bezeau, M.V. “The role and organization of Canadian military staffs : 1904-1945.” Kingston, Ont. : Royal Military College of Canada, 1978. Call #: 355.005 R65 1978-01.

Blom, J. M. “Reserve Force aircraft maintenance technicians : a training crisis.” Toronto, CFC, 1999.

Boyer, Alain. “Leadership and the Kosovo Air Campaign.” *Canadian Military Journal* 3, no. 3 (Autumn 2002), 37-44.

Cairns, Brett. “Aerospace Power and Leadership Perspectives.” *Canadian Military Journal* 3, no. 1 (Spring 2002), 37-44.

Canada. Canadian Armed Forces. Air Command. “Air Doctrine Symposium: summary of proceedings,” 24 January 1984. [Ottawa] : Dept. of National Defence, [1984?]. Call #: 358/.40010971/C35.

- Canada. Canadian Army. Historical Section. "Manpower problems of the Royal Canadian Air Force during the Second World War." Ottawa : Army Headquarters, Historical Section, 1954. Call #: 940.544971 C3 1954.
- Canada, Department of National Defence. The Aerospace Capability Framework. Ottawa: Director General Air Force Development, 2003. Available at www.airforce.forces.gc.ca/vision/acf_e.asp.
- Canada, Department of National Defence. Strategic Vectors. Ottawa: Director General Air Force Development, 2004. Available at www.airforce.forces.gc.ca/vision/strategic_e.asp.
- Canada, Department of National Defence. Security Above All: Transforming Canada's Air Force. Ottawa: Director General Air Force Development, 2004. Available at www.airforce.forces.gc.ca/vision/index_e.asp.
- Canada. Royal Canadian Air Force. Organization and functions of Air Force headquarters. [Issued under the authority of the Chief of the Air Staff.] Ottawa: Air Force Headquarters, 1958. Call #: 358/.400971/C35/no. 0015.
- Canada. Royal Canadian Air Force Air Historical Section. RCAF logbook: a chronological outline of the origin, growth and achievement of the Royal Canadian Air Force. Ottawa: King's Printer, 1949. Call #: 358/.400971/R33.
- Canada. Royal Canadian Air Force Fighter Wing, 1. "1 Fighter Wing : the first year 1951-52." [England]: Lewis Williams, 1952. Call #: 358/.400971/C253.
- Canada. Royal Canadian Air Force. Overseas. "Distribution of staff duties R.C.A.F. Overseas Headquarters : 1st February 1943." London : RCAF Overseas Headquarters, 1943. Call #: 940.544971 C36 1943.
- Canada's Air Heritage. Ottawa: Minister of National Defence for Air, 1941. Call #: 358.400971 C36 1941.
- Canadian Armed Forces, Air Command. "The Air Force today : Air Command brief." Winnipeg : Air Command, 1993. Call #: 358.400971 C43 1993.
- Canadian Armed Forces, Air Command. Handbook for Air Force non-commissioned members. Winnipeg, MB : Air Command Headquarters, Dept. of National Defence, 1992.
- Canadian Armed Forces, Air Command. "Master implementation plan for the wing concept." Winnipeg : Air Command, 1993. Call #: 358.400971 C4 1993.
- Carrier, J.L. Christian. "Transformation of the Canadian Forces: Is Aerospace Power Relevant?" Paper written for NSSC 5 available at wps.cfc.dnd.ca/papers/nssc/nssc5/carrier2.pdf.
- Christensen, Kyle D. Out of the sun and into the ground : an assessment of the decline of the Canadian Air Force. Ottawa : National Library of Canada [2004].
- Christie, Carl A. Ocean Bridge: The History of RAF Ferry Command. Toronto: Univ. of Toronto Press, 1995.

- Cooke, O.A. *The Canadian Military Experience 1867-1995: A Bibliography*, 3rd ed. Directorate of History and Heritage, Monograph Series No. 2. Ottawa: DND, 1997.
- Coombs, Howard. "Supporting Canadian Aerospace Expeditionary Forces: Air Power Sustainment in the 21st Century." In Allan D. English, ed. *Canadian Expeditionary Air Forces. Proceedings of the 2003 Air Symposium held at the Canadian Forces College. Bison Paper 5*, Winnipeg: Centre for Defence and Security Studies, 2004, 83-92.
- Dearnaley, E.J. and P.B. Warr, eds. *Aircrew Stress in Wartime Operations*. London: Academic Press, 1979.
- Douglas, W.A.B. *The Official History of the Royal Canadian Air Force. Vol. 2: The Creation of a National Air Force*. Toronto: Univ. of Toronto Press, 1986.
- , "Preparing for Different Wars: Canadian Naval and Air Force Relationships, 1918-1939." In *New Interpretations in Naval History: Selected Papers from the Tenth Naval History Symposium held at the United States Naval Academy, 11-13 September 1991*. Jack Sweetman, ed. Annapolis, MD: Naval Institute Press, 1993, 309-32.
- Dunmore, Spencer, and William Carter. *Reap the Whirlwind*. Toronto: McClelland and Stewart, 1991.
- English, Allan D., ed. *Air Campaigns in the New World Order. Silver Dart Canadian Aerospace Studies Series, Vol. 2*. Winnipeg: Centre for Defence and Security Studies, 2005.
- , *Canadian Expeditionary Air Forces. Proceedings of the 2003 Air Symposium held at the Canadian Forces College. Bison Paper 5*, Winnipeg: Centre for Defence and Security Studies, 2004.
- , *The Cream of the Crop: Canadian Aircrew 1939-1945*. Montreal and Kingston: McGill-Queen's University Press, 1996.
- , "The Education of an Air Force: Professional Military Education for the Canadian Air Force in the 21st Century" given at the Canadian Institute of Strategic Studies Spring Seminar, Toronto, ON, 9 April 1999. Published in David Rudd, et al., eds. *Air Power at the Turn of the Millennium*. Toronto: Canadian Institute of Strategic Studies, 1999, 63-76.
- , "How Science Really Works: Cultural Influences on Aviator Selection" (Keynote Address) and "A Predisposition to Cowardice?: Cultural Influences on Aviation Psychology" given at the 21st Conference of the Western European Association for Aviation Psychology, Trinity College, Dublin, 28-31 March 1994. Published in McDonald, Nick, Neil Johnston, and Ray Fuller, eds. *Applications of Psychology to the Aviation System*. Aldershot: Avebury Aviation, 1995, 38-43, 203-8.
- , "Leadership and Command in the Air Force: Can Non-Aircrew Command Flying Squadrons?" In Office of Air Force Heritage and History, ed. *Proceedings: 6th Annual Air Force Historical Conference*. Winnipeg, MB: Air Force History and Heritage, 2000, 79-86.

- , "Leadership and Lack of Moral Fibre in Bomber Command 1939-1945." In William March and Robert Thompson, eds. *The Evolution of Air Power in Canada*, Vol. 1. Winnipeg, MB: Air Command History and Heritage, 1997, 67-75.
- , "The Masks of Command: Leadership Differences in the Canadian Army, Navy, and Air Force." Given at the Conference on Leadership in the Armies of Tomorrow and the Future, Kingston, ON, 6-7 Feb 2002 and the Inter-University Seminar on Armed Forces and Society, Kingston ON, 25-27 October 2002.
- , "Naval Aviators and 'Flying Stress' 1914-1918." In Office of Air Force Heritage and History, ed. *Proceedings: 4th Annual Air Force Historical Conference*. Winnipeg, MB: Air Force History and Heritage, 1999, 19-29.
- , "Rethinking 'Centralized Command and Decentralized Execution'." In Douglas L. Erlandson and Allan English, eds. *Air Force Command and Control*. Toronto: Canadian Forces College, 2002, 71-82.
- , "Survey of current leader development in the air force." Report prepared for DRDC – Toronto. Kingston: KMG Associates, 2004.
- , *Understanding Military Culture: A Canadian Perspective*. Montreal & Kingston: McGill Queen's Univ. Press, 2004.
- English, Allan D. and Michael Rodgers. "Déjà vu: Cultural Influences on Aviator Selection." *Military Psychology* 4, (1992), 35-47.
- Ewashko, T.A. and F.P. Donovan. "Influence of obligatory service and acculturation on force structure." Winnipeg : Air Command, Operational Research Division, 1982. Call #: 355/.2236271/E83.
- Fergusson, James. "Over There, From Here: Expeditionary Forces and the Canadian Air Force." In Allan D. English, ed. *Canadian Expeditionary Air Forces. Proceedings of the 2003 Air Symposium held at the Canadian Forces College*. Bison Paper 5, Winnipeg: Centre for Defence and Security Studies, 2004, 43-54.
- Field, Peter J. *Canada's wings*. London: J. Lane, 1942.
- Forgues, Pierre. "Command in a Network Centric War." *Canadian Military Journal* 2, no. 2 (Summer 2001), 23-30.
- Foster, D.J. "Air Operations and Air Logistics." In Stuart Peach, ed. *Perspectives on Air Power*. London: The Stationary Office, 1998, 219-36.
- Foster, Tony. *For love and glory: a pictorial history of Canada's air forces*. Toronto : McClelland & Stewart, 1989.
- Garnett, G.L. "The Evolution of the Canadian Approach to Joint and Combined Operations at the Strategic and Operational Levels." *Canadian Military Journal* 3, no.4 (Winter 2002), 3-8.
- Gibson, Colin. "Air power in Canada - an address by Colin Gibson, Minister of National Defence for Air." Toronto : [s.n.], 1946. Call #: 358/.400971/G53.

- Gimblett, Richard. "The Canadian Way of War: Experience and Principles." In Allan D. English, ed. *Canadian Expeditionary Air Forces. Proceedings of the 2003 Air Symposium held at the Canadian Forces College. Bison Paper 5*, Winnipeg: Centre for Defence and Security Studies, 2004, 9-20.
- Goette, Richard. "Command and Control Implications for Canadian Forces Air Expeditionary Operations." In Allan D. English, ed. *Canadian Expeditionary Air Forces. Proceedings of the 2003 Air Symposium held at the Canadian Forces College. Bison Paper 5*, Winnipeg: Centre for Defence and Security Studies, 2004, 67-82.
- , "Cross Border Differences of Opinion: Canadian and American Air Force Command and Control Practices and Common Efforts in the Defence of Newfoundland." In John Herd Thompson and Michael D. Behiels, eds. *Re-Imagining Borders: Canada-United States Relations Since 1800*. Vancouver: University of British Columbia Press, forthcoming 2005.
- , "The Leadership of an Operational Commander: A Study of the Career of Rear Admiral L.W. Murray, RCN." *Canadian Forces Leadership Institute (CFLI) Research Paper*. Spring 2004. Available from CFLI.
- , "Plugging the Holes in the Roof: The Origins of a Northern Aerial Threat to North America and the Defence of Central Canada." In Office of Air Force Heritage & History, ed. *Proceedings, 7th Annual Air Force Historical Conference: Canada in NORAD*. Colorado Springs, CO, June 4-8 2001, 27-40.
- , "The RCAF in Atlantic Command During the Second World War: a Precursor to NATO's Atlantic Organization." In Office of Air Force Heritage & History, ed. *Proceedings, 8th Annual Air Force Historical Conference: The Air Force in a Global Perspective*. Cornwall, ON, 18-21 June, 2002, 1-31.
- , "The RCAF and the Creation of a RCN Air Arm: A Study of the Command and Control of Maritime Air Assets." *Canadian Military History* 13, no. 3 (Summer 2004), 5-13.
- , "Squadron Leader N.E. Small: A Study of Leadership in the RCAF's Eastern Air Command, 1942," *Canadian Military Journal* 5, no. 1 (Spring 2004), 43-50.
- , "Squadron Leader N.E. 'Molly' Small: A Study of Leadership Successes and Failures in the RCAF's Eastern Air Command, 1942." *Canadian Forces Leadership Institute Research Paper No. 38*. Spring 2003. Available on CFLI's website at: www.cda-acd.forces.gc.ca/CFLI/engraph/research/pdf/36.pdf
- , "The struggle for a joint command control system in the northwest Atlantic theatre of operations : a study of the RCAF and RCN trade defence efforts during the battle of the Atlantic." Unpublished MA thesis, Kingston: Queen's University, 2002.
- Gongora, Thierry. "The Meaning of Expeditionary Operations from an Air Force Perspective." Paper presented at the Seapower Conference 2002, Dalhousie University, Halifax, 7-9 June 2002. wps.cfc.dnd.ca/legacy/gongora.doc An expanded version of this paper is also available as "The Meaning of Expeditionary Operations from an Air Force Perspective." In Allan D. English, ed. *Canadian Expeditionary Air Forces. Proceedings of the 2003 Air Symposium held at the*

- Canadian Forces College. Bison Paper 5, Winnipeg: Centre for Defence and Security Studies, 2004, 21-34.
- Greenhous, Brereton, ed. *A Rattle of Pebbles: The First World War Diaries of Two Canadian Airmen*. Ottawa: Canadian Government Publishing Centre, 1987.
- Greenhous, Brereton, et al. *The Official History of the Royal Canadian Air Force. Vol. 3: The Crucible of War 1939-1945*. Toronto: Univ. of Toronto Press, 1994.
- Greenhous, Brereton and Hugh A. Halliday. *Canada's air forces, 1914-1999*. Montréal: Art global, 1999.
- "Group Captain." *The air force guide*. Toronto : Copp Clark, 1940. Call #: 358/400971/G76.
- Hall, D.I. "Inter-Service and Anglo-Canadian Co-operation: The Long and Troubled Development of Air Support for British and Imperial Armies in the Second World War." In Tremblay, Yves ed. *Canadian Military History Since the 17th Century* [Ottawa, DND: Directorate of History and Heritage], 205-12. Available at www.forces.gc.ca/hr/dhh/publications/engraph/Online_e.asp?cat=6.
- Halliday, Hugh A. *Chronology of Canadian military aviation*. Ottawa : National Museums of Canada, 1975.
- Harris, Stephen John. "Milestones in the operation of Canadian Forces College Extension School, 1960-1971." Toronto : Canadian Forces College, 1971. Call #: 355.0070971 H2 1971.
- Hart, J.O. and D.L. Ingram. "Retention of graduates of the Royal Canadian Air Force Regular Officer Training Plan (ROTP) for the period 1953 to 1965." Willowdale, Ont. : Canadian Forces Personnel Applied Research Unit, 1969. Call #: 355/.005/C35/TN-69-04.
- Hatch, F.J. *Aerodrome of Democracy*. Ottawa: Directorate of History, DND, 1983.
- Heide, Rachel Lea. "Canadian Air Operations in the New World Order." In Allan D. English, ed. *Air Campaigns in the New World Order*. Silver Dart Canadian Aerospace Studies Series, Vol. 2. Winnipeg: Centre for Defence and Security Studies, 2005, 77-92.
- , "Maintenance Considerations for a Canadian Expeditionary Air Force." In Allan D. English, ed. *Canadian Expeditionary Air Forces. Proceedings of the 2003 Air Symposium held at the Canadian Forces College*. Bison Paper 5, Winnipeg: Centre for Defence and Security Studies, 2004, 93-108.
- Henault, R.R. "Jointness, Expeditionary Force Projection and Interoperability: The Parameters of the Future." In Allan D. English, ed. *Canadian Expeditionary Air Forces. Proceedings of the 2003 Air Symposium held at the Canadian Forces College*. Bison Paper 5, Winnipeg: Centre for Defence and Security Studies, 2004, 3-8.
- Hitchins, F.H. *Air Board, Canadian Air Force and Royal Canadian Air Force*. Ottawa: Mercury Series, Canadian War Museum Paper No. 2, 1972.

- Hodson, Keith. "The RCAF air division in Europe." [Toronto : RCAF Staff College, 1955]. Call #: 358/.400971/H6395/1955.
- , "Speech to Junior Officers' Administrative Course, London, Ontario." Toronto : RCAF Staff College, 1955. Call #: 355/.0070971/H63/1955.
- Huddleston, David. "Air Force professional development in the 90s." [Kingston : General Officers' Symposium, National Defence College, 1991].
- , Canada's air force: moving ahead. Winnipeg, MB: Air Command Headquarters, 1992.
- , The Canadian Air Force flight plan : old wine, new bottles. Winnipeg, MB: Air Command Headquarters, 1992.
- Hunt, B.D. and R.G. Haycock. Canada's Defence: Perspectives on Policy in the Twentieth Century. Toronto: Copp Clark Pitman, 1993.
- Jockel, Joseph T. "After the September Attacks: Four Questions about NORAD's Future." Canadian Military Journal 3, no. 1 (Spring 2002), 11-16.
- , No Boundaries Upstairs: Canada, the United States, and the origins of North American Air Defence, 1945-1958. Vancouver: University of British Columbia Press, 1987.
- Johnston, Paul. "Canadian Hornets Over Kosovo: A Small Part of a Future Model for Air Power." In Office of Air Force Heritage & History, ed. Proceedings: 6th Annual Air Force Historical Conference. Winnipeg, MB: Air Force History and Heritage, [2001], 113-19.
- , "Canopy Glint: Reflections on Out of the Sun." In Douglas L. Erlandson and Allan English, eds. Air Force Command and Control. Toronto: Canadian Forces College, 2002, 83-97.
- , Organization for Canadian Air Force Command and Control. Unpublished paper presented at 2005 Air Symposium held at CFC, April 2005.
- Kealy, J.D.F. and E.C. Russell. A History of Canadian Naval Aviation, 1918-1962. Ottawa: The Naval Historical Section, DND, 1965.
- Kennett, Lee. The First Air War. New York: The Free Press, 1991.
- Kinsman, D.N. "Leadership Challenges for the New Century: A Personal Reflection." In Bernd Horn and Stephen J. Harris, eds. Generalship and the Art of the Admiral: Perspectives on Canadian Senior Military Leadership. St Catharines, ON: Vanwell Publishing, 2001, 147-54.
- Kostenuk, S and Griffin, J. RCAF Squadrons and Aircraft 1924-1968. Toronto: Samuel, Stevens, Hakkert, 1977 (Canadian War Museum - Historical Publication 14).
- Kowal, Harry, et al. "Air Force Operational Commanders of the Future: The Human Dimension." In Douglas L. Erlandson and Allan English, eds. Air Force Command and Control. Toronto: Canadian Forces College, 2002, 23-36.

- Lagassé, Philippe. "Northern Command and the Evolution of Canada-US Defence Relations." *Canadian Military Journal* 4, no. 1 (Spring 2003), 15-22.
- Lepage, Sylvain et al., "Air Power Theory." In David Rudd, et al., eds. *Air Power at the Turn of the Millennium*. Toronto: Canadian Institute of Strategic Studies, 1999, 117-40.
- Leversedge, T.F.J. "An Analysis of the Operational Art in the Korean Air War (1950-1953) – Lessons Re-Learned and Forgotten." Paper written for AMSC 6 available at wps.cfc.dnd.ca/papers/amsc/amsc6/leversedge.pdf.
- , "Transforming Canada's Air Force: Creating a Strategic Planning Process." In Allan D. English, ed. *Air Campaigns in the New World Order*. Silver Dart Canadian Aerospace Studies Series, Vol. 2. Winnipeg: Centre for Defence and Security Studies, 2005, 123-56. Also available at wps.cfc.dnd.ca/papers/nssc/nssc6/leversedge.pdf.
- Lieff, Abraham Harold. "Budget and procurement methods in the Royal Canadian Air Force." London : University of Western Ontario, 1951. Call #: 358.400971 L35 1951.
- Loesch, Anne, et al. "The Development of Air Force Operational Commanders." In Douglas L. Erlandson and Allan English, eds. *Air Force Command and Control*. Toronto: Canadian Forces College, 2002, 37-51.
- Lowe, A.H. "The RCAF Staff College." *Canadian Army Journal* 7, no. 3 (October 1953), 6-15.
- Macdonald, E.C. "Leadership in an Era of Change and Complexity." In Bernd Horn and Stephen J. Harris, eds. *Generalship and the Art of the Admiral: Perspectives on Canadian Senior Military Leadership*. St Catherines, ON: Vanwell Publishing, 2001, 167-88.
- McKechnie, L. M. *Home War: the R.C.A.F. guards our shores*. Canadian Printing and Lithographing Co., 1943. Call #: 940.544971 M263 1943.
- MacNalty, Arthur Salusbury and W. Franklin Mellor, eds. *Medical services in war: the principal medical lessons of the Second World War: based on the official medical histories of the United Kingdom, Canada, Australia, New Zealand and India*. London: H.M.S.O., 1968. Call #: 940.547542 M43 1968.
- Mcnamara, W. Don. "Intellectualism in the General Officer Corps." In Bernd Horn and Stephen J. Harris, eds. *Generalship and the Art of the Admiral: Perspectives on Canadian Senior Military Leadership*. St Catherines, ON: Vanwell Publishing, 2001, 491-506.
- Maillet, Léandre. "Military leadership profile of the Canadian Air Force." Research report 94-8. Richelain: Collège militaire royal de Saint-Jean, 1994. (RMC Library call # 235217).
- Manson, Paul D. "Closing Remarks." In William March and Robert Thompson, eds. *The Evolution of Air Power in Canada*, Vol. 1. Winnipeg, MB: Air Command History and Heritage, 1997, 113-17.

- Margueratt, Dennis. "The Role of Air Operations Centre in an ISR-Dependent Force." In Dennis Margueratt and Allan English, eds. *Intelligence, Surveillance and Reconnaissance*. Toronto: Canadian Forces College, 2002, 127-9.
- Margueratt, Dennis and Allan English, eds. *Space in the 21st Century. Proceedings of the 2000 Air Symposium*. Toronto: Canadian Forces College, 2001.
- , *Intelligence, Surveillance and Reconnaissance. Proceedings of the 2001 Air Symposium*. Toronto: Canadian Forces College, 2001.
- Martyn, Robert. "Signposts from the Past: Expeditionary Operations Revisited." In Allan D. English, ed. *Canadian Expeditionary Air Forces. Proceedings of the 2003 Air Symposium held at the Canadian Forces College*. Bison Paper 5, Winnipeg: Centre for Defence and Security Studies, 2004, 55-66.
- March, William. "The Royal Canadian Air Force and Peacekeeping." In *Peacekeeping, 1815 to Today: Proceedings of XXIst Colloquium of the International Commission of Military History*. Ottawa: Canadian Commission of Military History, 1995, 467-77.
- Mason, Dave, et al. "The Changing Face of War." In David Rudd, et al., eds. *Air Power at the Turn of the Millennium*. Toronto: Canadian Institute of Strategic Studies, 1999, 95-115.
- Milberry, Larry. *AIRCOM : Canada's air force*. Toronto: CANAV Books, 1991.
- , *Air transport in Canada*. Toronto: CANAV Books, 1997.
- , *Canada's Air Force today ... update*. Toronto: CANAV Books, 1991.
- , *Canada's Air Force at war and peace*. Toronto: Canav Books, 2000 - 2001.
- , *Sixty Years: The RCAF and CF Air Command, 1924-84*. Toronto: CANAV Books, 1984.
- Milberry, Larry and Hugh A. Halliday. *The Royal Canadian Air Force at War 1939-1945*. Toronto: CANAV Books, 1990.
- Morin, Jean. "The Command and Control of Air Transport Group During the Gulf War." In Office of Air Force Heritage & History, ed. *Proceedings of the 3rd Annual Air Force Historical Conference*. Winnipeg, MB: Air Command History and Heritage, 1998, 117-24.
- Morin, Jean and Richard H. Gimblett. *Operation Friction, 1990-1991: The Canadian Forces in the Persian Gulf*. Toronto: Dundurn Press, 1997.
- Nicks, Don, John Bradley, and Chris Charland. *A History of the Air Defence of Canada, 1948-1997*. North Bay: Commander, Fighter Group, Air Command, 1997.
- Noakes, Jeff. "Air Force Architect: Air Marshal Wilfred Curtis, Chief of the Air Staff, 1947-1953." In Bernd Horn and Stephen Harris, eds. *Warrior Chiefs: Perspectives on Senior Canadian Military Leadership*. Toronto: Dundurn Press, 2001, 237-56.

- Nossal, Kim "Canadian Foreign Policy: The Canadian Forces and Air Power." In David Rudd, et al., eds. *Air Power at the Turn of the Millennium*. Toronto: Canadian Institute of Strategic Studies, 1999, 17-22.
- O'Blenis, David. "The Canadian Aerospace Defence Industrial Base." In David Rudd, et al., eds. *Air Power at the Turn of the Millennium*. Toronto: Canadian Institute of Strategic Studies, 1999, 77-82.
- "Organisation of the RCAF." [S.l. : s. n.], 1944. Call #: 358.400971 O73 1944.
- Paquette, Dirk. "Organizational Change and Canada's Air Force." Unpublished thesis Univ. of Manitoba Political Studies Dept, 2001.
- Peden, Murray. *A Thousand Shall Fall*. Stittsville, Ont.: Canada's Wings, 1979.
- Pelchat, D. "Canadian Forces pilot retention study." Ottawa : Director Human Resources Research and Evaluation, National Defence Headquarters, 2002. Available from IRC, CFC.
- Penney, K.G. "A Matter of Trust: Ethics and Self-Regulation among Canadian Generals." In Bernd Horn and Stephen J. Harris, eds. *Generalship and the Art of the Admiral: Perspectives on Canadian Senior Military Leadership*. St Catherines, ON: Vanwell Publishing, 2001, 155-66.
- Pennie, K.R. "The Impact of Unification on the Air Force." In William March and Robert Thompson, eds. *The Evolution of Air Power in Canada*, Vol. 1. Winnipeg, MB: Air Command History and Heritage, 1997, 105-112.
- , "Strategic Thinking in Defence." *Canadian Military Journal* 3, no. 1 (Spring 2002), 21-8.
- Pettipas, Leo. "Counter-Currents: Co-Ordination and Co-Operation in Early Cold War Military Aviation." In Office of Air Force Heritage & History, ed. *Proceedings of the 5th Annual Air Force Historical Conference*. Winnipeg, MB: Air Command History and Heritage, [2000], 187-208.
- Pletsch, Mary Christine. "The guardian angels of this flying business : RCAF ground crew in 6 Group." Ottawa : National Library of Canada, [2003].
- Pratt, Gerald M. "A Clash Of Service Doctrines: Integration Versus Synchronization In Joint Operations." Paper written for AMSC 5 available at wps.cfc.dnd.ca/papers/amsc/amsc5/pratt.pdf.
- Raleigh, Walter, and H.A. Jones. *War in the Air*. Oxford: Clarendon Press, 1922-1937, 6 vols. and appendices.
- The R.C.A.F. overseas: the fifth year. Toronto : Oxford University Press, 1945. Call #: 940.544971 R34 1945.
- The R.C.A.F. overseas: the first four years. Toronto : Oxford University Press, 1944. Call #: 940/.544971/R34.
- The R.C.A.F. overseas: the sixth year. Toronto: Oxford University Press, 1949. Call #: 940.544971 R36 1949.

RCAF Staff College Journal. Periodical.

“Readings in air power.” Issued on the authority of the Air Officer Commanding Training Command, 1955. Call #: 358/.4155/R42.

Roberts, Leslie. Canada’s war in the air. Montreal : A.M. Beatty, 1942. Call #: 940/.544971/C2.

-----, There shall be wings: a history of the Royal Canadian Air Force. London : George G. Harrap, 1960.

St. Amand, Pierre. “The Canadian fighter force structure: a matter of policy and doctrine.” Toronto: Canadian Forces College, 2000.

St. Denis, Thomas and Emily Atkins, eds. The Future of Canada’s Air Force. Ottawa: Conference of Defence Associations Institute, 1990 (RMC Library call # UG635.C2F87 1990).

Sharpe, G.E. “C2 Evolution from an Air Force Perspective.” In Douglas L. Erlandson and Allan English, eds. Air Force Command and Control. Toronto: Canadian Forces College, 2002, 9-22.

Sharpe, G.E. and Allan English. Principles for Change in the Post-Cold War Command and Control of the Canadian Forces. Kingston, ON: Canadian Forces Leadership Institute, 2002.

Shores, Christopher F. History of the Royal Canadian Air Force Toronto : Royce Publications, 1984.

Soward, Stuart E. Hands to Flying Stations: A Recollective History of Canadian Naval Aviation, 2 Vols. Victoria, BC: Neptune Developments, 1995.

Sullivan, Alan. Aviation in Canada 1917-18. Toronto: Rous & Mann, 1919.

Szafranski, Richard. “Aerospace and Cyberspace: The Transformation of Small Air Forces.” In Dennis Margueratt and Allan English, eds. Space in the 21st Century. Toronto: Canadian Forces College, 2001, 15-30.

Taylor, R.K. “2020 Vision: Canadian Forces Operational-level Doctrine.” Canadian Military Journal 2, no. 3 (Autumn 2001): 35-42.

Thompson, Walter. Lancaster to Berlin. Toronto: Totem Books, 1987.

“Training in the Royal Canadian Air Force.” Scott Air Force Base, Illinois: Air Training Command , [1954?]. Call #: 358/.400971/T92.

Wakelam, Randall. “Aerospace power and leadership perspectives: The human dimension.” Canadian Military Journal 4, no. 3 (Autumn 2003), 17-24.

-----, “Air Power Writ Large: The Birth of the RCAF.” In Office of Air Force Heritage & History, ed. Proceedings of the 5th Annual Air Force Historical Conference. Winnipeg, MB: Air Command History and Heritage, [2000], 5-36.

Biography

Dr Allan English

Allan English joined the Royal Canadian Air Force in 1966 under the Regular Officer Training Plan. He attended Collège militaire royale de St-Jean and graduated from the Royal Military College of Canada (RMC) in 1971. He then served in the Canadian Forces (CF) for the next 20 years in various operational and instructional positions as an air navigator. He completed his MA in War Studies at RMC in 1987 and taught in the Military Psychology and Leadership Department there until he retired from the CF in 1991. He completed his PhD in history at Queen's University, Kingston, Ontario in 1993. His book, *The Cream of the Crop: Canadian Aircrew 1939-45* examines the Royal Canadian Air Force's selection and training procedures and its policies governing aviators who were considered unsuited for operational duties, especially those judged to have a "lack of moral fibre" (LMF). His book, *The Changing Face of War: Learning from History*, is an edited collection of essays applying lessons of the past to current and future defence problems. It has been translated into Chinese. Dr English has taught courses in the Theories of War, Air Warfare, and Human Behaviour in War at the post-graduate level in the War Studies and Continuing Education programmes at RMC. He acted as the academic advisor and taught Warfare Theory and History to the first seven Advanced Military Studies Courses held at the Canadian Forces College (CFC), Toronto and he was Co-Chair of the Aerospace Studies Department at CFC from 2001 to 2005. He was an advisor to the Board of Inquiry - Croatia on issues related to operational stress, leadership, and command and control. His book *Understanding Military Culture: A Canadian Perspective* was published by McGill-Queen's University Press in 2004. In the fall of 2005 the Canadian Defence Academy (CDA) Press published *The Operational Art - Canadian Perspectives: Context and Concepts* edited by Dr English, now Major-General Daniel Gosselin, Howard Coombs, and Capt (Navy) Laurence M. Hickey. The next book in the series, edited by Dr English, *The Operational Art - Canadian Perspectives: Leadership and Command* was published by CDA Press in the summer of 2006. The final book in the series, edited with Colonel James Taylor, *The Operational Art - Canadian Perspectives: Health Service Support* was published by CDA Press in the winter of 2006. His latest book, co-authored with Richard Gimblett and Howard Coombs, *Networked Operations and Transformation: Context and Canadian Contributions* will be published by McGill-Queen's University Press in the fall of 2007.

Dr English was a Senior Research Fellow at the Canadian Forces Leadership Institute 2002–2004. He is currently an adjunct associate professor in the History Department at Queen's University, where he teaches a graduate course in Canadian military history.

He has conducted research for Defence Research and Development Canada (DRDC) in the areas of command and control, leadership, and military culture. His business, KMG Associates, has written reports for DRDC on Network Enabled Operations as a Canadian Approach to Transformation, Air Force Leadership and Command, Command Styles in the Canadian Navy, Operational Readiness and Personal Readiness in the Canadian Forces, the Analysis of Command Challenges, and Military Culture.

Colonel (Retired) John Westrop

Colonel (Retired) John Westrop served with the Canadian Forces for 39 years. He graduated from the Royal Military College of Canada with a Bachelor's in Engineering in 1969, earned his pilot wings, and enjoyed flying tours with 439 Squadron, 2 Canadian Forces Flying Training School and Central Flying School. His operational flying was on the CF104 aircraft where he flew in the reconnaissance and ground attack roles in support of NATO's 4th Allied Tactical Air Force. He is a graduate of the CF Command and Staff College, the US Air Force Air War College, and he obtained a Masters of Public Administration from Auburn University in 1989. He has held staff positions in a number of Air Force headquarters including 14 Training Group (Staff Officer Leadership Training); Air Command (Senior Staff Officer Organization and Establishment and Executive Assistant to the Commander); Canadian Defence Liaison Staff (Washington) (Assistant Air Attaché); and 1 Canadian Air Division (A1 [Director] Personnel).

Twice posted to the Canadian Forces College, he served as Deputy Director Air Studies and as a member of the curriculum planning staff developing the National Security Studies Course. In 2000 he transferred to the Air Reserve, and working within the Director General Air Force Development organization he undertook a comprehensive study of CF Aerospace Doctrine. He authored a detailed report, which was accepted by the Air Board, and subsequently drafted a new manual of Strategic Aerospace Doctrine.