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The Rise and Fall of Canada's Cold War Air Force, 1948-1968

by

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BA (Hons) York University, 1978
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THESIS

Submitted to the Department of History
in partial fulfillment of the requirement for
Doctor of Philosophy

Wilfrid Laurier University

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Abstract

This thesis examines the expansion of the Royal Canadian Air Force (RCAF) under the St. Laurent government with the concept of the Big Air Force that emerged from the defence re-armament programme announced on 5 February 1951. During this critical Cold War period, the RCAF became Canada's first line of defence, making an essential contribution to the collective defence of Western Europe through the North Atlantic Treaty Organization. Concurrently, the RCAF underwent tremendous expansion in Canada contributing to North American defence, along with significant increases in its training, maritime and transport capabilities. The RCAF developed into the largest military service with the biggest portion of the defence budget. The notion of "airmindedness" that permeated all aspects of Canadian society enabled the development and implementation of the Big Air Force concept. Underlying the Big Air Force concept were two conflicting visions of air power, derived from leading theorists of the 1920s. The first was an independent role for aviation, "Douhet with nukes," a Cold War reference to the ideas of Italian General Giulio Douhet. The second approach was American General William Mitchell's "anything that flies" construct that embraced missions under the control of the army and navy and support to other agencies in such undertakings as air transport. By the late 1950s, the Big Air Force could not be sustained, thus marking its decline under the Diefenbaker and Pearson governments that was complete by the late 1960s. Despite some modernization in the late 1970s, successive governments adhered to the notion of a "minimalist air force" after 1969 until the end of the Cold War. This thesis considers the expansion and decline of the air force from the perspective of three inter-related thematic pillars – politics and economics, military strategy and technology. The predominance of air power represented the Canadian "way of war" during this time, and this legacy still resonates today with the ongoing debate regarding the *F-35* aircraft for the RCAF's Next Generation Fighter Capability programme.

Dedicated to the memory of my parents

Audrey Marie Frandsen (1913-1998)

Bertram Leslie Travers Frandsen (1912-2008)

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Abbreviations

1 CAG 1 Canadian Air Group
2ATAF 2nd Allied Tactical Air Force
4ATAF 4th Allied Tactical Air Force
10 TAG 10 Tactical Air Group
AAFCE Allied Air Forces Central Europe
ACE Allied Command Europe
AC&W Aircraft Control and Warning
AFCENT Allied Forces Central Europe
AFHQ Air Force Headquarters
AFVG Anglo-French Variable Geometry
AMB Air Materiel Base
AH Attack Helicopter
AMF(A) Allied Command Europe Mobile Force (Air)
AMF(L) Allied Command Europe Mobile Force (Land)
AMAE Air Member for Aeronautical Engineering
AMAP Air Member for Plans
AMAS Air Member for Air Staff
AMC Air Materiel Command
AMTS Air Member Technical Services
AOC Air Officer Commanding
AOP Air Observation Post
ASR Air Sea Rescue
ATC Air Transport Command
ATIP Access to Information and Privacy
AWX All Weather Fighter
BAFO British Air Forces of Occupation
BAI Battlefield Air Interdiction
BAOR British Army of the Rhine
BCATP British Commonwealth Air Training Plan
BOMARC Boeing Michigan Aerospace Research Center
CAF Canadian Air Force
CAF Canadian Armed Forces
CAMRA Canadian Advanced Multi-Role Aircraft
CAOF Canadian Army Occupation Force
CAS Chief of the Air Staff
CAS Close Air Support
CEF Canadian Expeditionary Force
CENTAG Central Army Group
CEPE Central Experimental and Proving Establishment
CEPS Central European Pipeline System
CFB Canadian Forces Base
CFE Canadian Forces Europe
CFHQ Canadian Forces Headquarters

DCOS Deputy Chief of Staff
CJATC Canadian Joint Air Training Centre
DA *Dalnaya Aviatsiya* (Long Range Aviation)
DGR Director General of Air Research
DHH Directorate of History and Heritage
DDP Department of Defence Production
DND Department of National Defence
FA *Frontovaya Aviatsiya* (Frontal Aviation)
FFAR Folding Fin Air Rocket
FY Fiscal Year
GA Ground Attack
HMCS His/Her Majesty's Canadian Ship
HVAR High Velocity Air Rocket
HQ Headquarters
HWE Home War Establishment
ICAO International Civil Aviation Organization
ICBM Inter Continental Ballistic Missile
IDF Interceptor Day Fighter
IGB Inner German Border
IRBM Intermediate Range Ballistic Missile
KT Kiloton
LRPA Long Range Patrol Aircraft
LSA Logistics Support Arrangement
LOH Light Observation Helicopter
MATS Military Air Transport Service
MND Minister of National Defence
MOU Memorandum of Understanding
MRA-75 Multi-Role Aircraft 1975
MRBM Medium Range Ballistic Missile
MRCA Multi-Role Combat Aircraft
MSF Mobile Striking Force
MTBF Mean Time Between Failures
MTH Medium Transport Helicopter
NATO North Atlantic Treaty Organization
NDHQ National Defence Headquarters
NFA New Fighter Aircraft
NORAD North American Air Defence Command
NORTHAG Northern Army Group
O&M Operations and Maintenance
OTU Operational Training Unit
PJBD Permanent Joint Board on Defence
POL Petroleum, Oil and Lubricants
PVO Strany *Protivo Vozdushnaya Oborona Strany* (Anti-Air Defence of the Nation)
RAF Royal Air Force
RAAF Royal Australian Air Force
RCAF Royal Canadian Air Force

RCNAS Royal Canadian Naval Air Service
RCN Royal Canadian Navy
Recce Reconnaissance
RFP Request for Proposals
RSAF Royal Swedish Air Force
RTTP Reserve Tradesman Training Plan
SAC Strategic Air Command
SACEUR Supreme Allied Commander Europe
SACLANT Supreme Allied Command Atlantic
SAGE Semi-Automatic Ground Environment
POL Petroleum Oil and Lubricants
SHAPE Supreme Headquarters Allied Powers Europe
STOL Short Take Off and Landing
Sqn Squadron
TAC Tactical Air Command
TAG Tactical Air Group
TFF Tactical Fighter Flight
TSF Transport Support Flight
UE Unit Establishment
UK United Kingdom
UN United Nations
UNEF I United Nations Emergency Force I
UNOC United Nations Operation in the Congo
URTP University Reserve Training Plan
US United States
USAAF United States Army Air Forces
USAF United States Air Force
USAFE United States Air Forces in Europe
USMC United States Marine Corps
USN United States Navy
USSR Union of Soviet Socialist Republics
UTTH Utility Tactical Transport Helicopter
VIP Very Important Person
VTOL Vertical Take Off and Landing
WE War Establishment

Chapter 1

Introduction and Literature Review

Canadian experience during the Second World War ensured that air power would be an essential part of Canadian defence in the post-1945 period, and it was during the years of the Louis St. Laurent government from 1948 to 1957 that the Royal Canadian Air Force (RCAF) reached the apex of its development.¹ The emphasis placed on the RCAF by the St. Laurent government ensured its dominance among the Canadian armed forces for a generation.

Air power became the “Canadian way of war” during the St. Laurent years, or at least the “Canadian way of deterrence.” For a short time, the RCAF was one of the top half-dozen air forces in the world.² Wartime ‘post-hostilities’ planning that carried into the early post-war years was for a small, but balanced and independent air force.³ This approach was dashed with the outbreak of the Korean War in 1950 that necessitated a rapid expansion of the RCAF to meet the demands of collective defence both in North America and Western Europe. The development as a balanced force gave way to specialized alliance roles resulting in the build up of a large fighter force. The RCAF was able to achieve both quality and quantity, but in the longer term was unable to sustain this level of effort. The seeds of its eventual decline were planted in its very

¹ A taxonomy for identifying a tiered methodology for categorizing air forces in terms of quality and functionality is also missing. See Colonel James Cottingham, Commanding Officer, Canadian Forces Aerospace Warfare Centre, “An Air Force Taxonomy,” Powerpoint presentation at the Aerospace Power Forum 2005, “The Demand-Resource Dilemma: The Experiences of 2nd and 3rd Tier Air Forces,” Centre for Defence and Security Studies, University of Manitoba, Winnipeg, MB, 22-23 November 2005.

² According to the Canadian Forces Chief Historian Stephen J. Harris, the RCAF could be rated as a Tier 1 air force until 1958, and thereafter Tier 2+ throughout the Cold War, Aerospace Power Forum 2005.

³ See Alexander Babcock, *The Making of the Cold War Air Force: Planning and Professionalism in the Postwar Royal Canadian Air Force, 1944-1950*. Unpublished PhD Thesis, Carleton University, Ottawa, Ontario, 2009.

expansion, a decline that became pronounced during the Diefenbaker and Pearson governments of 1957-68.

The term “air power” has been used since the early beginnings of manned powered flight, but there has not been a universally accepted definition of the term. The term “airpower” has been used and abused by both proponents and opponents of air warfare represented by such works as Alexander P. de Seversky, *Air Power: Key to Survival* (1950) and Marshall Andrews, *Disaster Through Air Power* (1950).⁴ The starting point for this project, therefore, was the definition used by the RCAF during the 1950s, which mirrored that of the RAF: “Air power means the use of the air to enforce the national will.”⁵ In the course of the research I have further defined air power as “the application of air force resources to meet Canadian national and international defence and collective security commitments.” This refinement owes much to Stefan Possony’s “elements of air power” described in his seminal study, *Strategic Air Power* (1949) discussed later in this chapter.⁶

This thesis will examine the development of air power in Canada during the St. Laurent years from 1948 to 1957 with an emphasis on the RCAF’s expansion after the outbreak of the Korean War in 1950, a period that has been referred to as the “golden years of the RCAF.”⁷ The notion of a “golden age” in Canadian defence and diplomacy is a recurring issue in the historiography.⁸ However, a closer examination of the RCAF’s supposed Golden Age in the

⁴ See Alexander P. de Seversky, *Air Power: Key to Survival*, New York: Simon and Schuster, 1950, and Marshall Andrews, *Disaster Through Air Power*, New York: Rinehart & Company, Inc, 1950.

⁵ Air Ministry. Royal Air Force Manual – *Operations*, AP 1300, January 1950, p. 19.

⁶ Stefan T. Possony, *Strategic Air Power: The Pattern of Dynamic Security*, Washington: Infantry Journal Press, 1949.

⁷ See Larry Milberry, *Sixty Years: The RCAF and CF Air Command 1924-1984*, Toronto: CANAV Books, 1984, p. 258 and James Eays, *In Defence of Canada – Volume 4: Growing Up Allied*, Toronto: University of Toronto Press, 1980, p.38.

⁸ See Andrew Cohen, *While Canada Slept: How We Lost Our Place in the World*, Toronto: McClelland and Stewart Ltd, 2003, Marc Milner, *Canada’s Navy: The First Century* (2nd Edition), Toronto: University of Toronto Press,

early stages of this project raised fundamental questions about the accuracy of this label. It soon became evident that the Golden Age of the RCAF needed to be explored in a broader context, as existing studies are quite narrowly focused. In fact, many of the difficulties and significant cutbacks that the air force endured during the Diefenbaker and Pearson governments from 1957 to 1968 and later were manifestations of lapses and shortcomings during the St. Laurent years. The massive expansion of the Golden Age in the early 1950s was a scramble in response to dramatic changes in the international security environment. The first part of this thesis shows how the rapid changes in military strategy and technology during the early 1950s resulted in political and economic commitments to a large air force that were reactive and crisis-driven rather than broadly considered and forward looking. It is true that the RCAF achieved pre-eminence among the forces in terms of manpower, equipment, and budgetary priorities, as emphasized in the existing literature on the Golden Age of the service. However, the present study will demonstrate that the over-riding commitment to air power for the country's defence was transitory. A severe weakness for the RCAF as an institution was a failure to appreciate the impact of continuing rapid changes in technology, the strategic environment, and Canadian politics. These changes in fact challenged the purposes of the Golden Age air force and the ability and willingness of the country to sustain such a large service even before the end of the St. Laurent administration in 1957.

The research question that began this study was why Canada developed a large air force, in particular for what purposes. Central concerns all through the project were the question “does

2010, and Peter Kasurak, *A National Force: The Evolution of Canada's Army, 1950-2000*, Vancouver, UBC Press, 2013.

size matter” and the issue of quality versus quantity for military effectiveness.⁹ The intellectual challenge that arose during the research was the increasingly evident need to place the Golden Age of the RCAF as popularly presented during the St. Laurent years in context by addressing subsequent developments, principally the challenges – manifested most concretely in the erosion of budgets -- of the Diefenbaker and Pearson years, 1957-1968. What began as an exploration of the unheralded expansion of the period 1950-1957 became a study of the rise and fall of what I have referred to as the “Big Air Force concept.” The latter term includes the vision of the RCAF’s leadership, and also the government’s airmindedness in facilitating the realization of that vision. The St. Laurent government’s commitment saw the RCAF emerge as the “senior” military service, with the biggest budget, the biggest slice of military manpower, and a leading place in the development of the nation’s aviation industry. Of the three services, the RCAF alone achieved most of its desired “wish list” for expansion.¹⁰

At the heart of the “Big Air Force concept” was the RCAF leadership’s commitment to “independent” air power, that is, an almost complete priority for roles independent of the other armed services. Indeed, the air staff engaged in continuous and sometime acrimonious opposition to the development of aviation arms of the army and navy to meet those services’ specialized needs on the premise that only the air force should operate aircraft. Confidence in

⁹ Both Canada and Australia have made the claim that each nation’s air force, the RAAF and RCAF, was “the fourth largest air force in the world” at the end of the Second World War. Raw numbers and different dates do not tell the entire story. See “World’s Fourth Largest Air Force?” *Pathfinder*, Royal Australian Air Force Air Power Development Centre Bulletin, Issue 119, September 2009.

¹⁰ In the case of the RCN, it never realized its goal of a second aircraft carrier, whilst the Canadian Army did not expand to a corps or even a complete division. For the Canadian Army, see DHH 73/1223, Series 1, Box 13, File 265, Consideration of MRC 5/2 and Canadian Proposals to Close the Gap, 10 September 1951, and Sean M. Maloney, *An Identifiable Cult: The Evolution of Combat Development in the Canadian Army 1946-1965*, Directorate Land Strategic Concepts Report 9905, Kingston, ON: Department of National Defence, 1999. In the case of the RCN, see Michael Whitby, “Fouled Deck: The Pursuit of an Augmented Aircraft Carrier Capability for the Royal Canadian Navy, Part 1, 1945-56,” *The Canadian Air Force Journal*, Vol. 3, No. 3 Summer 2010, and “Fouled Deck: The Pursuit of an Augmented Aircraft Carrier Capability for the Royal Canadian Navy, Part 2, 1956-64,” *The Canadian Air Force Journal*, Vol. 3, No. 4, Fall 2010.

the primacy of “independent” air power for national defence also bred confidence that the circumstances that had brought such large and rapid expansion of the air force in 1950-1957 would not change, or at least not significantly.

The expansion and then decline of the air force will be examined from the perspective of three inter-related thematic pillars. First is the political dimension, particularly Canadian civil-military relations and the economics of defence budgeting. Second is the evolution of military strategy as part of Canada’s defence alliances and bi-lateral arrangements within the context of the Cold War. Third, expansion and decline needs to be examined in relation to the rapidly changing military technology during this period, including its impact on the political and military strategy, especially in response to the Soviet Union’s acquisition of nuclear weapons and delivery systems. As well, the implications for air power of the Korean War need to be considered. The build up during and after that war had a long-term impact on the future development of the RCAF; much of this impact resulted in negative consequences for its institutional well-being. The governments lead by John Diefenbaker and Lester Pearson inherited the results of decisions made during the St. Laurent government regarding the RCAF. The response by the Diefenbaker and Pearson governments to RCAF force development requirements and plans will be addressed in detail.

This thesis is a study of a military institution during a critical period in the Cold War from the perspective of the RCAF staff, whose key ideas were embodied in what is termed here the Big Air Force concept. The main narrative traces the fate of the Big Air Force concept – from substantial realization in 1950-1957 to gradual and then accelerated erosion -- in the context of Canadian government policies. From this larger perspective, the narrative shows how the airmindedness of Canadian leaders waned in the face of ongoing international developments

and changing relations within the Western alliance, even as the air force leadership remain wedded to the ideas that had driven the remarkable expansion of 1950-1957. Thus the thesis is a study of an organization, summoned to extraordinary and successful expansion by unheralded international crises in the late 1940s and early 1950s then failing to react to changing circumstances on the international stage and in Canadian politics.

Politics, Technology, and Strategy

“Airmindedness,” the conviction that aviation was a key to the future of nations and mankind that first emerged in the First World War, became still more important after the Second World War among political leaders and the public alike, and was essential to the successful promotion of Canadian air power. Jonathan Vance, in *High Flight: Aviation and the Canadian Imagination*, provides an insightful analysis of airmindedness in the Canadian context.¹¹ He defined the concept in the years following the First World War as “an enthusiasm for flying, a belief in the future of aviation and excitement of what the airplane could do for Canada.”¹² With rearmament in the late 1930s, the Mackenzie King government gave priority to the modernization of the RCAF rather than the Canadian Army. Despite the existence of defence plans that called for the dispatch of army expeditionary forces, Prime Minister Mackenzie King viewed the RCAF as the nation’s first line of defence. On the outbreak of war in September 1939, the government succumbed to popular demands and those of English Canadian ministers to dispatch an army expeditionary force to the United Kingdom, but gave top priority to air force expansion through the launching of the vast British Commonwealth Air Training Plan (BCATP),

¹¹ Jonathan Vance, *High Flight: Aviation and the Canadian Imagination*, Toronto: Penguin Books, 2002.

¹² Ibid. p.108. For an American perspective, see Steve Call, *Selling Air Power: Military Aviation and American Popular Culture after World War II*, College Station, TX: Texas A&M University Press, 2009. A British post-war perspective is provided by James Hamilton-Patterson, *Empire of the Clouds: When Britain’s Aircraft Ruled the World*, London: Faber and Faber Limited, 2010.

which included the development of training facilities across the country and kick started the exponential growth of aircraft production. Over 70,000 RCAF aircrew were recruited and trained through the BCATP and they formed over twenty percent of the aircrew strength in the British Commonwealth's main air force combat commands, especially the RAF's Bomber Command. This tremendous growth in air-mindedness during the Second World War had a great impact in the post-war period.

Policies during the St. Laurent years represented a renewal of Liberal government programmes enacted by Mackenzie King starting in 1935, more fully developed with the apprehension of war in 1938-39 and realized on a grand scale during the Second World War. The salient features of the King government's initiatives were: promotion of military aviation as a spur to the growth of civil aviation for national development, particularly through stimulus for large-scale aircraft manufacturing and such infrastructure as airfields, re-armament of the RCAF as the front line for both home defence and overseas expeditionary forces, and ambitious air training programmes in which civilian and military facilities would be mutually supporting.

This air-mindedness – the embrace of aviation as a key to the nation's future – was uncharacteristic for the exceedingly cautious King. Certainly the lead role for the air force seemed little more than fantasy in 1935. The RCAF, meagre in size and largely committed to support of civilian aviation, was administered as a branch of the Army, and scarcely existed as a military organization. It achieved organizational autonomy from the Army and the status of a full-fledged military service only towards the end of 1938.¹³

¹³ See James Eayrs, *In Defence of Canada, Volume 1 – From the Great War to the Great Depression*, Toronto: University of Toronto Press, 1964, Chapter 5, pp. 185-223 and Chapter 7, pp. 287-302, and James Eayrs, *In Defence of Canada, Volume 2 – Appeasement and Rearmament*, Toronto: University of Toronto Press, 1965, pp. 91-114. See also W.A.B. Douglas, *The Creation of a National Air Force, The Official History of the Royal Canadian Air*

Yet aviation, and the air force in particular, seemed convincingly to meet Canada's political and economic circumstances in the face of Depression, international crisis, and then world war. Transportation had always been the key to development of Canada's vast territory, and aviation was clearly the successor to the railway revolution of the 19th century on which the new federation had been built. The large role Canada played during the First World War in supplying and training air crew for the British air services had provided the basis for the growth of civil aviation in the 1920s, and demonstrated that air forces, in sharp contrast to the Army and the Navy, directly spurred the development of essential civilian services and infrastructure. These broad considerations provided the context for the particular political usefulness of the air force: to avoid the necessity for conscription to sustain an overseas land force as had been necessary in 1917-18. The Liberal Party had achieved political dominance after the First World War by pledging never to impose conscription, and thus securing a bedrock of support in French Canada, the focus of the most vehement opposition to conscription. Air forces at once demanded very few front line personnel compared to land forces, but required massive training and industrial facilities. Provision of those essential services would keep many men and women safely removed from combat.¹⁴

St. Laurent's experiences as Mackenzie King's Quebec lieutenant during the conscription crises of the Second World War, and then, in 1946-48, as the secretary of state for external affairs provided him with acute insights into the art of the possible for Canadian post-

Force- Volume II, Toronto: University of Toronto Press, 1986, Chapters 1-5, and Roger Sarty, "Mr. King and the Armed Forces," in Norman Hillmer et al (eds.) *A Country of Limitations: Canada and the World in 1939*, Canadian Committee for the History of the Second World War/Canada. Department of National Defence/Directorate of History, 1996.

¹⁴ See Eayrs

In Defence of Canada, Volume I – From the Great War to the Great Depression and *In Defence of Canada, Volume 2 – Appeasement and Rearmament*, Douglas, *The Creation of a National Air Force* and Sarty, "Mr. King and the Armed Forces."

war defence policy, in which air power figured prominently. In his capacity as the Minister of National Defence (MND) from 1947 to 1954, Brooke Claxton, was a strong advocate for air power as Canada's first line of defence. The emphasis on the RCAF's pre-eminent role in Canadian defence continued during the tenure of Ralph Campney as the MND, in the period 1954-57. Similarly, C.D. Howe's wartime experience as the minister of munitions and supply, and then as the minister of defence production in the St. Laurent cabinet provided another source of support for the Big Air Force concept. From the benches of Her Majesty's Official Opposition, the Progressive Conservative defence critic, Major General (Retired) Georges Pearkes, was a keen advocate of air power, and would remain so while MND (1957-59) in the Diefenbaker government. Within the RCAF, successive chiefs of the air staff (CAS), Air Marshal Wilf Curtis (1947-53), a veteran of the First World War Royal Naval Air Service and an architect of the BCATP, and Air Marshal Roy Slemon (1953-57), who had served since the early days of the RCAF in 1920s and occupied senior staff positions in the bombing offensive against Germany during the Second World War, provided the necessary leadership for the service to gain its pre-eminence.

However, there were opposing views to large-scale air force expansion, most noticeably, but unsurprisingly, amongst senior officers of the Canadian Army, such as Lieutenant General Guy Simonds, chief of the general staff, 1951-55 and Major General W.H.S. Macklin, adjutant general, 1949-54. As the Canadian Army's "personnel manager" during the tremendous expansion during the Cold War to meet forward defence requirements in Korea and Northwest Europe, Macklin witnessed first hand how the Big Air Force concept progressed at the expense of the Army. After his retirement in 1954, he was alarmed at the considerable defence resources that were expended for North American "Maginot Line" style air defences. This opposition was

to manifest itself both within National Defence Headquarters (NDHQ) and also in the form of more public debate, particularly after Simonds' retirement in 1955.¹⁵ In addition, there was internal RCAF opposition to the development of the service as a nuclear equipped "alliance" air force in the early 1960s, a programme that did not appear to be focused on future challenges.¹⁶

Defence economics was a key factor in policy debates as air forces were much more expensive to equip, train and operate compared to armies, and the rapid advance of technology during this period soon made expensive investments in aircraft and weapons obsolete. In *The Rise and Fall of the Great Powers*, Paul Kennedy wrote in 1989 of the "upward spiral" which described the increasing cost of each successive generation of military equipment; this was particularly the case with aircraft.¹⁷ The end result was that fewer and fewer aircraft could be procured in each successive generation of more sophisticated, and more costly, types.¹⁸

Within the realm of strategy, there were rapid changes in thinking about a future war involving the RCAF. Escott Reid, an official in the Department of External Affairs, who played a key role in the drafting of the North Atlantic Treaty, detailed the events that led to the establishment of the Alliance in *A Time of Fear and Hope: The Making of the North Atlantic*

¹⁵ See Lieutenant General Guy G. Simonds, "Where We Have Gone Wrong on Defence," *Maclean's*, 23 June 1956 and "We're Wasting Millions on an Obsolete Air Force," *Maclean's*, 4 August 1956. See Major General W.H.S. Macklin, "The Costly Folly of our Air Defence Policy," *Maclean's*, 18 February 1956.

¹⁶ Remarks by Air Vice Marshal Frederick Carpenter, Air Officer Commanding (AOC) Air Transport Command, *Royal Canadian Air Force AOC Conference 15-17 March 1960*, Appendix G, "Long Range Future of Canada's Defence Forces – Discussion and Presentations by AOCs," 17 March 1960, DHH 73/1223 Series 3, Subseries XIV, Box 103, File 2007.

¹⁷ Paul Kennedy, *The Rise and Fall of the Great Powers: Economic Change and Military Conflict from 1500 to 2000*, London: Fontana Press, 1989, p. 570. For example, in the case of RCAF post-war fighter aircraft, the unit flyaway cost increased from the *Mustang* of \$54,000 in 1947, to the 1950s *Sabre* at \$360,000, to the 1960s *CF-104* at \$1.2 million to the 1980s *CF-18* at \$24 million. RCAF aircraft costs are from T.F.J. Leversedge, *Canadian Combat and Support Aircraft*, St Catherines: Vanwell Publishing Limited, 2007

¹⁸ Though the costs of aircraft increased due to the complexity and sophistication of their electronics, weapons systems and materials, there were ultimately lower life cycle costs of reduced maintenance due to the increased reliability. However, the early jets and jet engines were very maintenance-intensive. See David Edgerton, *The Shock of the Old: Technology and Global History since 1900*, New York: Oxford University Press, 2007, Chapter 4.

Treaty 1947-1949.¹⁹ Despite an initial belief that the formation of the alliance would result in decreased defence expenditures, the outbreak of the Korean War resulted in a sharp increase in alliance defence spending from \$20 billion to \$54 billion by 1952.²⁰ NATO defence from that time reflected the belief that the conduct of a major war would be similar to the Second World War, and hence the need for large conventional land, naval and air forces equipped to fight a long war of attrition. For the RCAF, this would have meant a build up to include not only an organization at War Establishment equipment and manning levels, but with large additional numbers of aircraft to replace losses due to battle and operational training, together with the necessary stockpiles of fuel, ammunition, spares and technical stores to maintain these fleets of aircraft. The North Atlantic Council meeting at Lisbon in 1952 set force goals of 96 divisions and 9,000 aircraft for the Central European Region. Even as these goals were agreed to, it was tacitly acknowledged that they were unattainable. The NATO nations could not undertake this level of rearmament while also building up their economies, the essential foundation for Western strength.

The stalemate of the Korean War caused the United States and other countries to re-examine their strategy. For the American government, this resulted in the adoption of the “New Look” by the Eisenhower administration in 1954. This strategy relied upon the concept of Massive Retaliation whereby it would respond with nuclear weapons even in the event of small brushfire wars, thereby reducing the need to maintain large armies and tactical air forces in peacetime. Great Britain issued its *Global Strategy Paper* in 1952 that placed increased emphasis on nuclear weapons in lieu of large-scale conventional forces. The adoption of nuclear weapon

¹⁹ Escott Reid, *A Time of Fear and Hope: The Making of the North Atlantic Treaty, 1947-1949*, Toronto: McClelland and Stewart, 1977.

²⁰ Ibid. pp. 236-237.

based policies was to significantly influence the development air power after the Korean War. This major shift in the policies of two of NATO's major members was reflected in the change in alliance strategy from reliance on large conventional forces that would require national mobilization of its members to an emphasis on smaller forces-in-being integrated with nuclear weapons. This change, embodied in the strategic guidance contained in documents such as MC 14/1 and MC 48, took place over the short period from 1952 to 1954. Such rapid change did not allow sufficient time for the smaller NATO nations to re-equip or re-structure their military forces.

Some of the strategic issues that require exploration include the NATO concerns about "closing the gap" with apparently preponderant Soviet bloc armed forces strength that were the subject of important staff talks in 1951-52, the emergence of the bomber "gap," and then the better known missile "gap," and the place of peacekeeping in Western and Canadian policy. From the perspective of Canadian air force policy, these and other issues raised myriad challenges for a small power in filling specialized roles in a changing alliance strategy while addressing national needs for a balanced air force of more diverse capabilities. The competing visions of air power represented by the "Douhet with nukes" approach versus the Mitchell "anything that flies" version were constants in the period under discussion.

The Douhet approach related to the central argument of the Italian general's *The Command of the Air* (first published in 1921): offensive action through bombing was the essence of air power. Other aspects of air power, including fighters, were superfluous.²¹ In Douhet's view, there was no need for the army or naval services.²² Despite the inconclusiveness of the

²¹ Giulio Douhet, *The Command of the Air*, New York: Arno Press, 1972.

²² See David MacIsaac, "Voices from the Central Blue: The Air Power Theorists," in Peter Paret (ed.) *Makers of Modern Strategy: from Machiavelli to the Nuclear Age*, Princeton: Princeton University Press, 1986 and Phillip S.

Second World War strategic bombing experience, nuclear weapons provided new impetus to Douhet's theory, particularly in the USAF.²³ Strategic bombing proponents, who dominated the American service, dismissed tactical aviation (and air defence) with their mantra of "not a pound for air-to-ground."²⁴ In the Canadian context, the RCAF leadership gave primacy to the acquisition of nuclear weapons for the interdiction bombing role in NATO and strategic air defence in NORAD, and considered other missions as subordinate or unnecessary.

The contrasting approach to air power, built on the ideas of the U.S. Army aviation pioneer General William "Billy" Mitchell, also attached paramount importance to offensive action through bombing, but recognized the necessity of supporting the army and navy with specialized aviation capabilities tailored to their needs.²⁵ In a Canadian context, advocates of the Mitchell approach presented this as a balanced air force consisting of various air power functions rather than simply the "nuclear air force."

The importance of air power within the context of Canadian defence policy remains one of debate today. The current debate regarding the acquisition of the *F-35 Lightning II* Joint Strike Fighter as a replacement for the *CF-18* for the RCAF perpetuates the unending dispute

Meilinger, "Giulio Douhet and the Origins of Airpower Theory," in Phillip S. Meilinger (ed.) *The Paths of Heaven: The Evolution of Airpower Theory*, Maxwell Air Force Base, Alabama: Air University Press, 1997.

²³ See Bernard Brodie, *Strategy in the Missile Age*, Princeton: Princeton University Press, 1959, particularly Chapter 3, "The Heritage of Douhet."

²⁴ See Richard P. Hallion, "A Troubling Past: Air Force Fighter Acquisition since 1945," *Airpower Journal*, Vol. 4, No. 4, Winter 1990. The proponents of this phrase believed that fighters should only be used to maintain "control of the air" through air superiority, and not be used in support of the land battle.

²⁵ See MacIsaac and Mark A. Clodfelter, "Molding Airpower Convictions: Development and Legacy of William Mitchell's Strategic Thought," in Meilinger, *The Paths of Heaven*. See also William Mitchell, *Winged Defense: The Development and Possibilities of Modern Air Power – Economic and Military*, New York: G.P. Putnam's Sons, 1925.

and angst among Canadians regarding the Avro *Arrow* cancellation of 1959 – a decision that still remains one of controversy over fifty years later.²⁶

The subject of this study is a critical one as the future of air power has re-emerged as a key element in contemporary Western defence planning. The importance of air power appeared to be minimized at the end of the Cold War, despite the initial tendency by its advocates to gloat how air power had “won” the first Persian Gulf War in 1991 and the Kosovo War in 1999. In subsequent conflicts in the Balkans, Iraq and Afghanistan, air power represented Mitchell’s “anything that flies” approach with air power as the enabler for “boots on the ground,” not as the final arbiter. Perhaps, this development was so much the case that contemporary and future conflict was seen as “war amongst the people,” with its emphasis on counter-insurgency, with a marginal need to understand the utility of air power.²⁷ This represented air power in transition, due to changes in military strategy and technology, a phenomenon similar to that faced by the RCAF in the late 1950s and 1960s. Emerging aerospace technologies are transforming air power, but at a cost that few nations will be able to afford, including the leading air power nations.²⁸ This aerospace transformation will not result in the complete disappearance of manned combat aircraft, as prematurely announced in the 1957 British Defence White Paper, but it does portend a great reduction in their use and the complementary use of unmanned aerial vehicles. The concept of the role of air power has also evolved from that of applying coercive force through the use or threatened use of kinetic capabilities to that of an “Intelligence, Surveillance and Reconnaissance (ISR) force.” This concept is really not new as it harks back to the original

²⁶ Jeff Jedras “Still Wrong About Fighters 50 Years Later,” *National Post*, 15 October 2010.

<http://fullcomment.nationalpost.com/2010/10/15/jeff-jedras-still...> [accessed 19 October 2010].

The mythology related to the Avro Arrow continues unabated. See Lewis Mackenzie, “Bring Back the Arrow,” *Ottawa Citizen*, 10 September 2012.

²⁷ This phrase is from General Rupert Smith, *The Utility of Force: The Art of War in the Modern World*, New York: Alfred A. Knopf, 2005, p. xiii.

²⁸ Martin Van Creveld, *The Age of Airpower*, New York: PublicAffairs, 2011.

role of air power as enunciated at its birth – providing the capability to see what was on the “other side of the hill.”²⁹

Though the requirements for independent air power and the technology of the manned bomber were a perennial issue during its doctrinal apex in the period from the 1930s to the early 1950s, today’s impending transformation has resulted in the unprecedented questioning of the requirement for independent and separate organizations for the future application of air power.³⁰ Interestingly, two recent British Chiefs of the General Staff, General Mike Jackson and General Richard Dannatt, openly criticized what has been perceived as the airpower fixation with “fast jets.”³¹ The tremendous reductions for the RAF contained in the British Strategic Defence and Security Review of October 2010 represent one example of this approach.³² In Canada, though there have been no overt suggestions to “abolish” the Air Force, one of Lieutenant-General Rick Hillier’s first acts when appointed Chief of the Land Staff in 2003 was to submit a memorandum to the government recommending an army-centric approach to the Canadian Forces.³³ Similarly, the widespread interest in the proposed acquisition of the Canadian Forces’ next generation

²⁹ For a discussion of the importance of airpower as the “eye in the sky” during the First World War, see John Terraine, “Lessons of Air Warfare,” *RUSI Journal*, Vol. 137, Issue 4, August 1992, pp. 53-58.

³⁰ The continuing relevance for maintaining the air force as a separate service has particularly attracted attention in the United Kingdom. For example, see Nigel Foster, “Can the RAF Survive?” *Armed Forces*, Vol. 7, No. 1, January 1988, pp. 6-10. A more recent critique has been Colonel Tim Collins, “It’s Time to Abolish the RAF,” *The First Post*, 12 May 2006. <http://www.thefirstpost.co.uk/?storyID=5602> [Accessed 8 August 2007] That these arguments carry significant weight has resulted in a response – see Wing Commander Shaun Harris, *The Value Of An Independent Royal Air Force – Breaking The “Oscar Wilde Paradigm” in British Defence*, School of Advanced Air and Space Studies, Air University, Maxwell Air Force Base, June 2010. For the argument to abolish the U.S. Air Force, see Robert M. Farley, *Grounded: The Case for Abolishing the United States Air Force*, Lexington: University Press of Kentucky, 2014.

³¹ See General Sir Mike Jackson, *Soldier: The Autobiography*, London: Corgi Books, 2008, p. 463, and General Sir Richard Dannatt, *Leading from the Front: The Autobiography*, London: Transworld Publishers, 2010, pp. 246 and 390.

³² Government. United Kingdom. *Securing Britain in an Age of Uncertainty: The Strategic Defence and Security Review*, Cm 7948, October 2010 [http://www.direct.gov.uk/en/NI1/Newsroom/DG_191706, accessed 16 March 2011] See comments by air power historian Christina Goulter, “Defence Review: Arguments for Air Power Must Not be Ignored,” *Telegraph*, 16 September 2010, <http://www.telegraph.co.uk/news/newsttopics/politics/defence/8...> [accessed 13 October 2010].

³³ See Michael J. Hood, “Why Canadian Airmen Are Not Commanding,” *Canadian Military Journal*, Vol. 11, No. 3, Summer 2011.

fighter capability represents another example of the questioning of the traditional rationale for air power.³⁴ This study assists in the assessment of the contemporary air power dilemma by its historical analysis of those linkages of politics and economics, strategy and technology from an earlier period.

Literature Review

This study also endeavours to provide a critical missing element in the historiography of Canadian air power, particularly for the Cold War period. The historiography of air force official history has been marked with as much disappointment as success.³⁵ Although a historical section was formed in 1940 at the government's direction to record the RCAF's activities in the Second World War, there was still a myriad of difficulties promoting its activities. Firstly, there was the opposition from senior RCAF officers who questioned the utility of the historical section. Secondly, RCAF record keeping, both in quality and quantity, left something to be desired. Thirdly, there was the problem of RCAF squadrons serving with the Royal Air Force (RAF), whereby tactical records were readily available, but the higher-level operational and strategic documentation had to be obtained through the RAF.³⁶

Starting in 1944, the RCAF Historical Section prepared and issued three volumes entitled the *RCAF Overseas: the First Four Years, the Fifth Year and the Sixth Year*. This series was not intended to be an academic history, but a narrative of RCAF operations for the promotion of airmindedness. The third volume was not published until 1949 and covered the last year of the war from September 1944. Its introductory chapter also espoused the concept of "airmindedness" to promote the post-war RCAF:

³⁴ See Allan Woods, "Scrapping Fighter Jets Risks Grounding Air Force, Mackay Warns," Toronto Star, 27 January 2011, <http://www.thestar.com/printarticle/929270> [accessed 28 January 2011].

³⁵ Kenneth B. Conn, "The Royal Canadian Air Force Historical Section, *The Canadian Historical Review*, Vol. 26, No. 3, September 1945, pp. 246-250.

³⁶ *Ibid.* pp. 246-250.

The Regular Force will constitute a highly trained nucleus around which the RCAF can be expanded in time of national emergency, while the Auxiliary will provide a reserve of fully organized, manned and equipped units which can be mobilized quickly into a tactical air component for operations in conjunction with the Canadian Army, in the same way that RCAF wings formed part of the 2nd Tactical Air Force during the war in Europe.³⁷

In 1946, the Director of the Historical Section, Wing Commander Fred Hitchins, proposed a nine volume official history of the RCAF; two volumes to deal with the service's early history, six volumes to cover the Second World War and a ninth volume to encompass specialized topics.³⁸ However, in an era of fiscal restraint, the minister directed that all work on the history of the war be to be concluded by 1 April 1948.³⁹ Hitchins, along with a clerk-typist, was to continue until 1961 as the Director of the RCAF Historical "Section." According to Colonel C.P. Stacey, the failure to produce an official air force history resided with Claxton who predicted interest in the Second World War would quickly fade so there would be very few readers.⁴⁰ However, during this period, the Army Historical Section, appealing to the more robust tradition of historical studies in the land forces, was able to engage in considerable research and publication efforts. These included the Canadian Army official history of the multi-volume Second World War history and a single volume First World War history. In addition, the Army Historical Section was able to produce a study on "Manpower Problems of the Royal Canadian Air Force during

³⁷ Historical Section, Royal Canadian Air Force, *The RCAF Overseas: The Sixth Year*. Toronto: Oxford University Press, 1949, p. 7.

³⁸ W.A.B. Douglas, "Filling Gaps in the Military Past: Recent Developments in Canadian Official History," *Journal of Canadian Studies*, Vol. 19, No. 3, Autumn 1984, p.114.

³⁹ *Ibid.* p.114. The Air Force Historical Section was able to produce *RCAF Logbook: A Chronological Outline of the Origin, Growth and Achievement of the Royal Canadian Air Force*. Ottawa: King's Printer, 1949. This publication was issued to commemorate the 25th anniversary of the RCAF.

⁴⁰ C.P. Stacey. *A Date with History: Memoirs of a Canadian Historian*. Ottawa: Deneau Publishers, 1983, pp. 196-197. According to Stacey, Claxton told him that as the RCAF had fought with the RAF, the British should tell the story of the RCAF!

the Second World War!”⁴¹ The absence of an official RCAF history may have been more the result of the lack of support by the RCAF hierarchy than the scepticism and budget cutting of Claxton.⁴² According to Tim Cook in *Clio’s Warriors: Canadian Historians and the Writing of the World Wars*, Air Marshal Wilf Curtis, the Chief of the Air Staff, was culpable for the demise of RCAF history:

Curtis had always acknowledged the importance of an official history in not only educating the war’s lessons, but also in publicizing the RCAF’s deeds to all Canadians. Yet it is also clear that the CAS was not willing to devote significant resources to the project.⁴³

The production of the initial volume of the Official History of the RCAF fell to Colonel Stacey’s replacement, Sydney Wise, in the integrated DND Historical Section. Production of the first volume spanned a thirteen-year period from initial research in 1967 until its publication in 1980. The second volume was published in 1986 with the third volume appearing in 1994 just as the DND Directorate of History was undergoing a massive reduction. The introduction to the third volume notes, “This is the third of a projected four-volume series outlining the history of the Royal Canadian Air Force.” With the cutbacks in the Directorate of History, the proposed fourth volume that would have examined the post-1945 RCAF was cancelled. The decision not to proceed with the fourth volume of the air force official history is perhaps reflective of the reluctance to address the study of air power and air force history in Canada.⁴⁴ Scot Robertson has argued that the RCAF has been badly served by historians who “...have tended to focus upon aircraft, technology, squadron histories, individual memoirs and the like. Major efforts at

⁴¹ Historical Section, Army Headquarters, Report No 67, *Manpower Problems of the Royal Canadian Air Force During the Second World War*, Ottawa, 15 January 1954.

⁴² Ronald Haycock with Serge Bernier, *Teaching Military History: Clio and Mars in Canada*. Athabasca: Athabasca University, 1995, p. 6 and Stacey, *A Date with History*, p. 196

⁴³ Tim Cook. *Clio’s Warriors: Canadian Historians and the Writing of the World Wars*. Vancouver: UBC Press, 2006, p. 163.

⁴⁴ See Scot Robertson, “What Direction? The Future of Aerospace Power and the Canadian Air Force – Part I,” *Canadian Military Journal*, Vol. 8 No. 4, Winter, 2007-2008.

synthesizing Canada's overall airpower experience are lacking."⁴⁵ The absence of this fourth volume has had a negative impact on our understanding of the critical role played by the RCAF in the post-Second World War period.

The absence of a comprehensive and scholarly official history may have resulted in a void in the historiography, but equally damaging is what D.C. Watt referred to as "The Air Force View of History."⁴⁶ Watt was commenting on RAF history and specifically that service's survival during the inter-war period by promoting strategic bombing – an 'independent' role that kept the service free of cooperation with the army and navy and possible loss of resources to those services -- and the subsequent acceptance of those ideas as orthodoxy that justified the RAF's concentration on strategic bombing in the Second World War. In Watt's view, acceptance and espousal of these flawed interpretations by senior RAF leaders led to a narrow view of air power in the post-war era. This lesson is also applicable to RCAF history. The 1950s may have been "the golden age" for the RCAF, based on the receipt of the largest slice of defence resources and the necessary political support. Nevertheless, the RCAF was only able to sustain its position for little more than a decade. This would lead one to suggest that there were other factors at play than acceptance of the orthodoxy of 'independent' air power by the political leadership and public that explain the RCAF's pre-eminence during this period.

Within the realm of popular history, several attempts to produce a history of the RCAF during the post-war period have had limited success.⁴⁷ Similarly, individual RCAF squadron histories are of dubious utility, produced as they have been either by enthusiasts or by coerced squadron

⁴⁵ Ibid. See footnote 14.

⁴⁶ D.C. Watt, "The Air Force View of History," *Quarterly Review*, Vol. 300, No. 634, October 1962.

⁴⁷ Leslie Roberts, *There Shall Be Wings: A History of the Royal Canadian Air Force*, Toronto: Clarke, Irwin & Company, Limited, 1959. This "drums and bugles" approach is a prime example of what Watt referred to as "the air force view of history." For a useful overview of the post-war period, the "Golden Years" of the 1950s and 1960s, see Larry Milberry, *Sixty Years: The RCAF and Air Command 1924-1984*, Toronto: CANAV Books, 1984, and *Canada's Air Force at War and Peace, Volume 3*: Toronto: CANAV Books, 2001.

officers.⁴⁸ These popular volumes are intended to appeal to a broad audience but they do fulfill a purpose, not addressed by the official histories, as they act as a reminder that air forces are composed of people and not only flying machinery.

Two key publications that cover the period are James Eayrs' *In Defence of Canada, Volume 3 – Peacemaking and Deterrence* and *Volume 4 – Growing Up Allied*.⁴⁹ These volumes provide an in-depth analysis of the political and diplomatic dimensions on re-establishing the post-war military and early Canadian alliance developments. However, Eayrs' works are not exclusively focussed on the study of air power and they suffer from the limitations of accessible files from that time period.

Jon McLin's book, *Canada's Changing Defense Policy, 1957-1963: The Problem of a Middle Power in Alliance*, is a superbly insightful examination of defence policy in the period after the St. Laurent government, under the Progressive Conservative administration of John Diefenbaker.⁵⁰ McLin also provides some useful analysis on the initial difficulties faced by the Pearson government that came to power in 1963, but his work is incomplete as it was written and published too close to the actual time period under discussion (1967) before the full impact could be assessed. As well, McLin's work suffers from not having full access to government files for the period.

Stefan Possony's *Strategic Air Power*, published in 1949, is essential reading for the understanding of contemporary air power. This unrecognized classic, which details how air power involves more than simply airplanes, supplied the framework for the analysis in the

⁴⁸ To gain an appreciation of RCAF organization for the post-war period, see Samuel Kostenuk and John Griffin, *RCAF Squadron Histories and Aircraft 1924-1968*, Historical Publication 14, Canadian War Museum/National Museum of Man, Toronto: Samuel Stevens Hakkert & Company, 1977.

⁴⁹ James Eayrs, *In Defence of Canada, Volume 3 – Peacemaking and Deterrence*, Toronto: University of Toronto Press, 1972 and *In Defence of Canada, Volume 4 – Growing Up Allied*, Toronto: University of Toronto Press, 1980.

⁵⁰ Jon B. McLin, *Canada's Changing Defense Policy, 1957-1963: The Problems of a Middle Power in Alliance*, Baltimore: Johns Hopkins University Press, 1967.

present study.⁵¹ Possony, an Austrian émigré to the US prior to the Second World War, became a strategic analyst at Princeton University and later at the Hoover Institute. In later years, he became known as the “intellectual father of Star Wars,” the US Strategic Defense Initiative of the 1980s.⁵² Possony was a profound early post-war strategic analyst who was largely ignored in his time. Within DND, copies of *Strategic Air Power* were held in the National Defence Library in Ottawa, the RCAF Staff College Library in Toronto and the Royal Military College of Canada Library in Kingston so it is likely that some keen RCAF staff officers would have been aware of Possony’s work. An examination of the RCAF during this period and how it developed into the Big Air Force was not just a matter of policy, but consisted of the various building blocks presented by Possony fifteen “elements of air power” including equipment, infrastructure and industry that will be discussed in Chapter 2.⁵³ These types of details are the reality with which a professional military staff officer had to contend in the development of the Big Air Force.

The role played by nuclear weapons increased in importance throughout the 1950s. NATO conventional forces were intended to act as a “tripwire” in response to a Soviet attack, with the principal NATO response and defence being based on US strategic and NATO tactical nuclear weapons. This increasing reliance on nuclear weapons at the expense of conventional weapons was again reversed in the 1960s with the emergence of more realistic policy options for NATO in the form of flexible response presented in MC 14/3. In examining Canadian air power, it is essential to consider this increasing role for nuclear weapons both in the context of NATO and the defence of North America.

⁵¹ Possony, *Strategic Air Power*. Airpower historian, Phillip S. Meilinger has noted: “*Strategic Air Power* is an overlooked gem, probably the best work on airpower theory in the post-World War II era.” See *Airmen and Air Theory: A Review of the Sources*, Maxwell Air Force Base, Alabama: Air University Press, 2001, p. 132.

⁵² “Stefan Possony: Pioneered Air Strategy in WWII,” *Los Angeles Times*, 9 May 2004
http://articles.latimes.com/1995-05-03/news/mn-61669_1_stefan-possony [Accessed 22 November 2014].

⁵³ Possony, p. 35.

The first book to appear on the Canadian acquisition of nuclear weapons was John Clearwater's *Canadian Nuclear Weapons: The Untold Story of Canada's Cold War Arsenal*.⁵⁴ Clearwater's book highlights the extent to which the effectiveness of the Canadian armed forces depended upon possession of nuclear weapons during the Cold War, particularly for an uninformed public who have adhered to the more benign "peacekeeping" image of the Canadian Forces. However, this book does not provide a comprehensive analysis of what the possession of nuclear weapons implied for Canadian defence. Within a Canadian context, a commonly accepted view has been that Canada, as a junior member in NATO, and the junior member in the North American defence, blindly acquiesced to the adoption of nuclear weapons without serious analysis or examination. Two more scholarly publications have effectively refuted this assertion. In *Avoiding Armageddon: Canadian Military Strategy and Nuclear Weapons 1950-63*, Andrew Richter clearly indicates that Canada was cognizant of the strategic implications related to the introduction of nuclear weapons into her armed forces.⁵⁵ He cites numerous studies, particularly on air defence, undertaken by Defence Research Board scientists such as Dr. R.J. Sutherland and Dr. George Lindsay. Sean Maloney's *Learning to Love the Bomb: Canada's Nuclear Weapons during the Cold War* provides a detailed study on the acquisition of nuclear weapons by the Canadian armed forces examining the myriad issues from both the military and political dimensions, and from a Canadian and NATO perspective.⁵⁶

Joseph Jockel's *No Boundaries Upstairs: Canada, the United States, and the Origins of North American Air Defence, 1945-1958*, provides an excellent background to the issues related

⁵⁴ John Clearwater, *Canadian Nuclear Weapons: The Untold Story of Canada's Cold War Arsenal*, Toronto: Dundurn Press, 1998.

⁵⁵ Andrew Richter, *Avoiding Armageddon: Canadian Military Strategy and Nuclear Weapons 1950-63*, Vancouver: UBC Press, 2002.

⁵⁶ Sean M. Maloney, *Learning to Love the Bomb: Canada's Nuclear Weapons During the Cold War*, Washington, D.C.: Potomac Books Inc, 2007.

to the development of the joint United States-Canadian North American Air Defence Command (NORAD) agreement. Jockel points out that although cooperative agreements for the air defence of the continent between the two nations did indeed date back to 1946, the conclusion of the integrated command was not by no means a “done deal” as is popularly presented.⁵⁷ Similarly, Jockel explains, “the air defence of Canada was a Canadian project, not one Ottawa undertook at the behest of the American government. Claxton was correct to point out that Canada’s air defences served American as well as Canadian interests.”⁵⁸ This perspective contradicts the views of those anti-American Canadian ultra-nationalists who argue that Canada was coerced into these Cold War military alliances.⁵⁹

Linked very closely to the general subject of air defence in the post-war period is the large body of literature on the Avro *Arrow* supersonic fighter. The story of the Avro *Arrow* has assumed icon status in Canadian culture. More ink has been spilt promoting the mythology of the Avro *Arrow* rather than on a reasoned analysis of the advantages and disadvantages of the aircraft. This fascination with the Avro *Arrow* is an example of the ongoing airmindedness that continues to prevail among many Canadians, and not only aviation enthusiasts. Similarly, there has been a strong element of nationalism and anti-American sentiment, along with anti-Diefenbakerism associated with those who harbour a lingering fascination with the project. Exceptions include Murray Peden, a wartime RCAF bomber pilot, who was the first to produce a book-length study, *Fall of an Arrow* (1978). Peden presents a balanced narrative of events and concludes that it was economics that killed the project. He does raise the interesting observation

⁵⁷ Joseph T. 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. In November 1946, the Chief of the Air Staff, Air Marshal Leckie believed that the development of an integrated continental air defence system was not justified on either strategic or financial grounds, p. 26.

⁵⁸ *Ibid.* p. 121.

⁵⁹ See the vitriolic commentary in John W. Warnock, *Partner to Behemoth: The Military Policy of a Satellite Canada*, Toronto: New Press, 1970, and Lewis Hertzman, John W. Warnock and Thomas A. Hockin, *Alliances and Illusions: Canada and the NATO-NORAD Question*, Edmonton: M.G. Hurtig, 1969.

that Sweden was able to design and produce indigenous supersonic fighters.⁶⁰ James Dow declared in his 1979 book, *The Arrow*, “This is not a lament for the Avro Arrow.”⁶¹ His study is a generally fair examination of the decisions to spend hundreds of millions of dollars on high technology and the promotion of an advanced Canadian aircraft industry.⁶²

Russell Isinger’s 1997 MA thesis, the first scholarly analysis, effectively summarizes the Avro *Arrow* story:

...the project’s demise was the thus largely inescapable consequences of three interrelated factors: a flawed weapons acquisition process driven by an overly ambitious Royal Canadian Air Force, dramatic strategic shifts, and harsh financial realities.⁶³

Isinger’s well-reasoned analysis did not prevent continued attempts at capitalizing on the fascination with the Avro *Arrow*.⁶⁴ This study will address the Avro *Arrow* project, but it needs to be placed within the larger context of the build up of air power during this period and subsequent developments.

One cannot appreciate the political and strategic aspects of air power without a basic knowledge of technological developments.⁶⁵ *The Modern War Machine: Military Aviation since 1945* covers the various aspects such as the impact of nuclear weapons, jet engines, aerodynamics and structures, avionics, and the various types and roles of aircraft.

⁶⁰ Murray Peden, *Fall of an Arrow*. Stittsville: Canada’s Wings, 1978, p.154.

⁶¹ James Dow, *The Arrow*, Toronto: James Lorimer and Company, Publishers, 1979, p. 7.

⁶² Ibid. p. 7.

⁶³ Russell Isinger, *The Avro Canada CF-105 Arrow Programme: Decisions and Determinants*, Unpublished MA Thesis, University of Saskatchewan, Saskatoon, Saskatchewan, September 1997, p. 1.

⁶⁴ See Randall Whitcomb, *Avro Aircraft and Cold War Aviation*, St Catherines: Vanwell Publishing, 2002 and *Cold War Tech War: The Politics of America’s Air Defence* Burlington, Ontario: Apogee Books, 2008. The first book’s intent was purportedly an examination of Avro Canada on a ‘geo-political level’ but it was simply an Avro *Arrow* enthusiast’s opinion. The latter book was to allegedly “explore the geo-political, technical and economic aspects of the Avro Arrow story,” but despite access to primary materials, it presents only a US conspiracy against Canada. These books have perpetuated the Avro *Arrow* mythology among enthusiasts.

⁶⁵ To better understand the development of post-war air power from a comparative approach, see Robert Jackson, *Cold War Combat Prototypes*, Ramsbury, Marlborough: The Crowood Press, Ltd, 2005. Jackson examines the development of modern combat aircraft by numerous nations in the post-war period.

Among the best of the books that have examined the development and service of specific Canadian military aircraft are Larry Milberry's *The Avro CF-100* (1981) and *The Canadair Sabre* (1986).⁶⁶ A recent scholarly publication is Randall Wakelam's *Cold War Fighters: Canadian Aircraft Procurement, 1945-54* that examines RCAF acquisition of the Canadair Sabre and Avro CF-100 aircraft, when the planning to contend with the manned bomber threat was at its peak.⁶⁷ Wakelam makes it clear that, contrary to popular perception, the RCAF and the government were not happy with the implementation of the CF-100 programme by Avro Canada.

Vital as the production of military aircraft was to the realization of the Big Air Force concept, the history of the Canadian aircraft industry remains to be written.⁶⁸ Indeed, the only scholarly journal article to appear on Canada's post-war aviation industry is Lawrence Aronsen's piece in *The International History Review* in 1991.⁶⁹

Assessments of the value and effectiveness of Canadian air power are mostly absent; one exception being air power historian Scot Robertson's superb chapter, "Reflections on the Canadian Experience," contained in *Aerospace Power: Beyond 100 Years of Theory and*

⁶⁶ Larry Milberry, *The Avro CF-100*, Toronto: CANAV Books, 1981, and *The Canadair Sabre*, Toronto: CANAV Books, 1986.

⁶⁷ Randall Wakelam, *Cold War Fighters: Canadian Aircraft Procurement, 1945-54*. Vancouver: UBC Press, 2011. This book is based on Wakelam's MA thesis, *Flights of Fancy: RCAF Fighter Procurement 1945-1954*, Kingston, Ontario: Royal Military College of Canada, 1997.

⁶⁸ Ron Pickler and Larry Milberry, *Canadair: The First 50 Years*, Toronto: CANAV Books, 1995. This was a corporate sponsored book that provides a basic narrative of aircraft development and production at Canadair. Apart from the basic details on licensed-built aircraft such as the Sabre, T-33, CF-104 and CF-5, it also includes information on the design and development of Canadair aircraft such as the Argus maritime patrol bomber and the Yukon long-range turbo-prop transport. The definitive story of Canadair aircraft, with the exception of the Sabre, still waits to be written. Other enthusiast books on the Canadian aircraft industry include Fred W. Hotson's *The De Havilland Canada Story*, first published in 1983 and updated in 1999, and Kenneth H. Sullivan and Larry Milberry *Power: The Pratt and Whitney Canada Story* (1989). K.M. Molson and H.A. Taylor, *Canadian Aircraft since 1909*, Stittsville: Canada's Wings, 1982 is useful for its broad historical overview. For an early 1950s examination of the Canadian aircraft industry, see John Davis, "Aeroplane Industry in Canada," *Canadian Geographic Journal*, Vol. XLVII, No. 5, November 1953.

⁶⁹ Lawrence Aronsen, "'A Leading Arsenal of Democracy': American Rearmament and the Continental Integration of the Canadian Aircraft Industry, 1948-1953," *International History Review*, Vol. 13, No. 3 (Aug 1991).

Practice, the proceedings of the 2003 Aerospace Power Forum conducted by the Centre for Defence and Security Studies at the University of Manitoba.

For those who wish to begin to understand Canadian air power, Robertson's views provide a valuable insight into the major challenges. Robertson notes:

Aside from the three volumes of the official history of the RCAF from its origins in the Great War to the end of the Second World War, its story remains largely untold, except in the most fragmented manner. That is, perhaps, one of the greatest gaps in the body of Canadian military history, and something that the military history community should rectify.⁷⁰

According to Robertson, these gaps are the result of "an immature strategic culture," not only found at the highest levels of what passes for strategic thought in this country, but also in the military services themselves. If one accepts this line of reasoning, then it goes a long way to explaining the circumstances and resulting decisions of the 1950s and 1960s.⁷¹

The absence or limited research on the various personalities who directly influenced the development of air power during this period is a great limitation. There is only one now dated biography (published in 1967) on Prime Minister Louis St. Laurent that says almost nothing about his views on defence, despite its critical importance throughout his administration.⁷² This is a major gap in view of Douglas Bland's observation that "Canada's policy for national defence tends to be whatever the prime minister of the day says it is."⁷³ Defence ministers have fared better. David Bercuson's *True Patriot* deals with Claxton, the MND from 1947 to 1954,

⁷⁰ Scot Robertson, "Reflections on the Canadian Experience," in James G. Fergusson, *Aerospace Power: Beyond 100 Years of Theory and Practice*, Silver Dart Canadian Aerospace Studies, Volume 1, Winnipeg: Centre for Defence and Security Studies, University of Manitoba, March 2005, p. 25.

⁷¹ See Stephen L. James, "The Air Force's Cold War Struggle with its National Purpose," *3rd Air Force Historical Conference 1997*, Winnipeg: Department of National Defence, Office of Air Force Heritage and History, 1998.

⁷² Dale C. Thomson, *Louis St. Laurent, Canadian*, Toronto: Macmillan of Canada, 1967.

⁷³ Douglas Bland, "Everything Military Officers Need to Know About Defence Policy-Making in Canada," in Jim Hanson, David Rudd, Jessica Blitt (eds.), *Canadian Strategic Forecast 2000 – Advance or Retreat: Canadian Defence in the 21st Century*, Toronto: Canadian Institute of Strategic Studies, 2000, p. 15.

who was a strong supporter for the initial Cold War expansion of the RCAF.⁷⁴ Reginald Roy's biography of Pearkes includes details of his time as the Progressive Conservative Party's defence critic and later as the MND in the aftermath of the Liberal government's defeat in 1957.⁷⁵ Pearkes' short tenure as the MND included key decisions related to the RCAF including the cancellation of the Avro *Arrow*, re-equipment of both the Air Division and Air Defence Command, the re-equipment and expansion of Maritime Air and Air Transport Commands, and the decline of the Auxiliary Force. Paul Hellyer's memoirs provide useful insights that cover the period from his time as the Associate MND in the last days of the St. Laurent government, as the opposition Liberal Party defence critic and finally as MND in the Pearson government.⁷⁶ Other key personalities, who have had the benefit of a biography, in this case, two biographies, include long time Liberal Cabinet minister, C.D. Howe, who was key to the RCAF build up as the minister of defence production during the early 1950s.⁷⁷ There is a distinct lack of studies on the Canadian military leaders of the period. In the case of the RCAF, *Warrior Chiefs* contain chapters on two key Chiefs of the Air Staff, Wilf Curtis and Roy Slemon, but these are brief accounts.⁷⁸ Randy Wakelam is currently researching a biography on Curtis that is intended to address this long-standing gap in the historiography of RCAF senior leadership. Notably absent for the literature is anything of substance on the last two Chiefs of the Air Staff, Hugh Campbell

⁷⁴ David J. Bercuson, *True Patriot: The Life of Brooke Claxton, 1890-1960*, Toronto: University of Toronto Press, 1993.

⁷⁵ Reginald H. Roy, *For Most Conspicuous Bravery, A Biography of Major-General George R. Pearkes, V.C. Through Two World Wars*, Vancouver: UBC Press, 1977.

⁷⁶ Paul Hellyer, *Damn the Torpedoes: My Fight to Unify Canada's Armed Forces*, Toronto: McClelland and Stewart, 1990.

⁷⁷ Leslie Roberts, *C.D.: The Life and Times of Clarence Decatur Howe*, Toronto: Clarke, Irwin and Company Limited, 1957, and Robert Bothwell and William Kilbourn, *C.D. Howe: A Biography*, Toronto: McClelland and Stewart, 1979.

⁷⁸ Jeff Noakes, "Air Force Architect: Air Marshal Wilfred Austin Curtis, Chief of the Air Staff, 1947-1953," and Sandy Babcock, "Air Marshal Roy Slemon: The RCAF's Original," in Bernd Horn and Stephen Harris (eds.), *Warrior Chiefs: Perspectives on Senior Canadian Military Leaders*, Toronto: Dundurn Press, 2001.

and Larry Dunlap, who held this key appointment during the crucial period of the late 1950s and early 1960s.⁷⁹

In contrast to both the United States and United Kingdom, there has been limited academic writing on the topic of air power in Canada. A rare exception is Robert Sutherland's 1950 PhD dissertation from the University of Toronto.⁸⁰ It describes the growth in importance of military aviation from its initial beginnings in the First World War to maturity in the Second World War, and suggests that the emergence of the atomic bomb had not rendered conventional armaments and strategies obsolete. Dr. Sutherland is remembered for his contributions to Canadian strategic analysis whilst a member of the Defence Research Board until his untimely death at the age of 45 in 1967.⁸¹

Alexander (Sandy) Babcock's PhD thesis, *The Making of a Cold War Air Force: Planning and Professionalism in the Postwar Royal Canadian Air Force, 1944-1950*, argues that it was the air force's application of its outstanding planning skills in the early post-war period that enabled to the RCAF to gain such prominence during the "Golden Years" of the 1950s.⁸² However, it will be argued that the reasons for the RCAF's pre-eminence were a lot more complex than the premise that the Air Force had better planners. The Canadian Army and Royal

⁷⁹ The only other studies of the careers of post-war RCAF officers have been those of Air Chief Frank Miller, the First Chief of the Defence Staff, and Air Vice Marshal Fred Carpenter. See Ray Stouffer, "Air Chief Marshal Frank Miller: A Civilian and Military Leader," *Canadian Military Journal*, Vol. 10, No. 2, 2010 and Bertram Frandsen, "Air Vice Marshal Fred Carpenter and the RCAF Vision," 14th Annual Air Force Historical Workshop, Kanata, Ontario, 24-25 September 2008.

⁸⁰ Robert J. Sutherland, *The Economic and Political Consequences of Air Power*, Unpublished PhD Thesis, University of Toronto, Toronto, Ontario, 1950.

⁸¹ Sutherland's influence continues to live on. He is best remembered for his article, "Canada's Long Term Strategic Situation," *International Journal*, Vol. XVII, No. 3, Summer 1962. See James Lee and David Bellamy, "Dr R.J. Sutherland: A Retrospect," *Canadian Defence Quarterly*, Vol. 17, No. 1, Summer 1987, Paul Buteux, "Sutherland Revisited: Canada's Long Term Strategic Situation," *Canadian Defence Quarterly*, Vol. 24, No. 1, September 1994, and Dwayne Lovegrove, "Sutherland in the 21st Century: Invariants in Canada's Policy Agenda since 9/11," *Canadian Military Journal*, Vol. 10, No. 3, Summer 2010.

⁸² Babcock, *The Making of a Cold War Air Force: Planning and Professionalism in the Postwar Royal Canadian Air Force, 1944-1950*.

Canadian Navy also had ambitious plans for post-war expansion, most of which did not reach fruition.⁸³

Two complementary PhD theses from Queen's University have also added to our understanding of the RCAF and continental defence during the 1950s. Richard Goette, *Canada, the United States and the Command and Control of Air Forces for Continental Air Defence from Ogdensburg to NORAD, 1940-1957*, and Matthew Trudgen, *The Search for Continental Security: The Canadian-American Relationship and the Development of the North American Air Defence System, 1949-56*, add to the pioneering research conducted by Joseph Jockel on the origins of Canada's post-war air defence system.⁸⁴ It is important, however to consider the 1950s RCAF in a broader framework than continental air defence. The RCAF's key part in NATO's rearmament, national and alliance maritime operations, and its capabilities in strategic as well as tactical air transport are essential to an understanding of Canadian air power and RCAF expansion.⁸⁵

Among MA theses that have contributed to the literature are Stephen Nemeth's *Canadian Postwar Fighter Aircraft Acquisitions: An Analysis of the Strategic, Economic and Political Factors* (1989) and Glen Berg's *Scrambling for Dollars: Resource Allocation and the Politics of*

⁸³ See Sean M. Maloney, *An Identifiable Cult: The Evolution of Combat Development in the Canadian Army 1946-1965*. Maloney quotes the Canadian Army Combat Development Study, "The Canadian Army 1966-70 Tactical and Logistic Concept," that speculated on the growth of the Canadian Regular Army to 100,000 troops by the end of the 1970s (p. D-44). In reality, Canadian Land Forces numbered about 20,000 in 1980. See also Andrew B. Godefroy, *In Peace Prepared: Innovation and Adaptation in Canada's Cold War Army*, Vancouver: UBC Press, 2014.

⁸⁴ Richard Goette, *Canada, the United States and the Command and Control of Air Forces for Continental Air Defence from Ogdensburg to NORAD, 1940-1957*, Unpublished PhD Thesis, Queen's University, Kingston, Ontario, 2009 and Matthew Trudgen, *The Search for Continental Security: The Canadian-American Relationship and the Development of the North American Air Defence System, 1949-56*, Unpublished PhD Thesis, Queen's University, Kingston, Ontario, 2011.

⁸⁵ Raymond Stouffer, *An Expression of Canadian Nationalism: The History of the No.1 Royal Canadian Air Force Air Division and RCAF Cold War Air Power Choices 1952-70*, Unpublished PhD Thesis, Royal Military College of Canada, Kingston, Ontario, 2005. Stouffer's study is unique in that it was written using classified sources and has not yet been declassified. One PhD currently in progress that will add to an understanding of the RCAF's post-war circumstances is Paul Johnston's *Tactical Air Power in the Cold War*, Kingston, Queen's University, Kingston, Ontario.

Canadian Fighter Aircraft procurement, 1943-1983 (1994) that attempt to analyze the historical background of RCAF fighter procurement.⁸⁶ In dealing with the aftermath of the St. Laurent period, mention must also be made of Robert Clark's *Canadian Weapons Acquisition: The Case of the Bomarc Missile*.⁸⁷ Clark was a former Air Weapons Controller whose illustrates the difficulty in implementing new technology into the force structure when the strategic environment has been overtaken by apparently decisive technological change.⁸⁸

Journals

An examination of contemporary aviation journals for this thesis represented an untapped treasure trove of information as they included well-informed commentary on and debates about various aspects of air power. Some of the leading journals were *Canadian Aviation*, *Flight*, *Air Pictorial* and *The Aeroplane*. *Canadian Aviation* included a monthly column on RCAF affairs along with feature stories on Air Force developments. The latter three journals were British publications that occasionally included articles on the RCAF and Canadian aviation, reflecting the still strong Anglo-Canadian links during this period. The journalists writing in these publications were dedicated aviation specialists who spent years in the field. In the early 1950s, *Canadian Aviation* writers included Ronald Keith, Ross Wilmot and Victor Koby. Starting in the late 1950s and continuing until 1980, retired RCAF Wing Commander John Gellner contributed on a monthly basis.⁸⁹ The British journals included contributions from such authors

⁸⁶ Stephen Nemeth, *Canadian Postwar Fighter Aircraft Acquisitions: An Analysis of the Strategic, Economic and Political Factors*, Unpublished MA Thesis, Dalhousie University, Halifax, Nova Scotia, 1989, and Glen Berg, *Scrambling for Dollars: Resource Allocation and the Politics of Canadian Fighter Aircraft procurement, 1943-1983*, Unpublished MA Thesis, Royal Military College of Canada, Kingston, Ontario, 1994.

⁸⁷ Robert Clark, *Canadian Weapons Acquisition: The Case of the Bomarc Missile*, Unpublished MA Thesis, Royal Military College of Canada, Kingston, Ontario, 1983.

⁸⁸ Ibid.

⁸⁹ Gellner had served in the RCAF retiring as a Wing Commander on the Directing Staff at the RCAF Staff College in Toronto. Starting in the late 1950s and continuing until the late 1970s, he was a well-known defence commentator for *Canadian Aviation* magazine, an advisor to the Liberal Party on defence matters in the early 1960s, a lecturer on defence policy at York University, and editor of the *Canadian Defence Quarterly*.

as John Fricker, William Green and Bill Gunston who became world-renowned aviation experts and have only recently relinquished their roles. Also, the RCAF publication, *The Roundel*, was not merely a public relations journal, but included insightful articles on RCAF developments, along with reprints on air power topics from other Allied journals such as the *RAF Quarterly* and the *USAF Air University Review*.

Archival Sources

With the broad approach of this thesis, there were several concerns related to archival usage. One potential problem that was identified early in the research was the fact that many files related to Canada's air force and the Cold War remain classified. There was a concern that the submission of Access to Information and Privacy (ATIP) requests would involve considerable time without a guarantee that the results would provide the desired information. Archival sources used in this study were declassified Canadian government files primarily available from the Department of National Defence Directorate of History and Heritage (DHH) collection. Many of these files duplicate those that are found in Library and Archives Canada RG 24. The Colonel Robert Raymont collection was particularly important for researching the post-Second War period from the late 1940s until the early 1960s. Raymont served as the Executive Staff Officer to the Chairman, Chiefs of Staff Committee, resulting in his access to many files at the higher levels within DND and the government. Given the thesis' broad approach, another concern was the amount of time that would be consumed researching a vast quantity of files when the essence of the information being sought was contained in the Chiefs of Staff Committee and Air Council files included in the Raymont collection. In addition, the Raymont collection usually, though not always, contained copies of Cabinet conclusions and Cabinet Defence Committee minutes. The minutes from Air Council, Chiefs of Staff Committee

and Cabinet Defence Committee meetings were especially useful in following the trend of RCAF development during the critical period of the 1950s.⁹⁰ Equally useful were the proceedings of the annual Air Officer Commanding (AOC) conferences that included verbatim discussions, an aspect missing from the more concise and bureaucratic meeting minutes. Unfortunately, these types of files ceased to be kept by 1964 with the creation of a single integrated Canadian Forces staff that superseded the air force, army and naval staffs in Ottawa.

RCAF planning was a key element in implementing the Big Air Force concept and files containing Plans G and H in particular offer a wealth of information for the build up of the RCAF after 1948 into the early 1950s. The 1962 Report of the Special Studies Group on Long-Range Objectives for the RCAF (the “Carpenter Report”) makes for fascinating reading with its detailed strategic analysis along with the recommendations for an alternative RCAF force structure to deal with the expected international environment.⁹¹ The “Carpenter Report” was a refreshing read; rather than working from the usual service premise of justifying the need for a new aircraft, Carpenter’s Special Studies Group proceeded on the principle of first determining a possible future security environment, and then recommending the types of equipment and organization that might best meet the requirement. Much of the methodology, analysis and recommendations contained in the Carpenter Report remain current to this day. In a similar manner, the 1963 Report of the Ad Hoc Committee on Defence Policy under the chairmanship of

⁹⁰ There is a need, however, for some skepticism when reading the minutes. These minutes would have been reviewed by the senior officer as the committee chairman, and would reflect a concise and neat perspective of what transpired at a meeting, or what the approving authority wished to present of what transpired. The minutes would obviously not reflect what was not said or the body language of the attendees. The author had personal experience as the scribe for writing the minutes for a senior NDHQ board, in this case, on behalf of the Vice-Chief of the Defence Staff.

⁹¹ Col (Ret’d) Fred Carpenter, “The RCAF Report That Wasn’t,” *Canadian Military Journal*, Vol. 3, No. 2, Summer 2002. Col. Carpenter is the son of Air Vice Marshal Fred Carpenter, the author of the report.

Dr. Sutherland remains a useful study that challenged contemporary conventional defence thinking.

RCAF equipment files are subject to a “hit or miss” approach. Some files are fully accessible while others remain restricted. The Avro *CF-105 Arrow* files are accessible and provide a wealth of information that allows the researcher to follow the programme’s development and demise.⁹² However, in the case of the *Sparrow II* air-to-air missile, intended as the *Arrow*’s armament, the files remain restricted. The files on the re-equipment of the Air Division are open and provide an interesting perspective on aircraft selection from the 1950s.⁹³ Though occupying a relative minor role in Canadian air power, the files on the selection of the *CF-5* aircraft in 1965 also offer insights into the foibles of Canadian aircraft procurement.⁹⁴ However, files on the acquisition of the *CF-101B Voodoo* interceptor in 1961 remain inaccessible, as do the files on the *CF-18* selection in the 1970s.

In the case of other RCAF subjects in RG24, it is also a “hit and miss” affair. Nearly all files related to No. 1 Air Division remain restricted or closed, though some Operations Planning files from the early 1950s are available, later ones are not. The Mobile Striking Force files are open, but in the case of Air Defence, many files still remain restricted. Strategic level RCAF logistics planning also remains restricted. As well, though some files on nuclear weapons have been opened, there are still closed files on the subject. Numerous files related to NATO and to Anglo-Canadian or American-Canadian defence relations also remain closed. There are numerous intelligence files from the period that have yet to be de-classified, and this restriction

⁹² This probably explains why people are still writing on the subject today.

⁹³ The Air Division re-equipment files make for very interesting reading in light of the recent imbroglio related to *F-35* procurement plans.

⁹⁴ See Raymond Stouffer, “Cold War Air Power Choices for the RCAF: Paul Hellyer and the Selection of the *CF-5* Freedom Fighter,” *Canadian Military Journal*, Vol. 7, No. 3, Autumn 2006.

was another area that prevented a complete understanding of the threat faced by the RCAF and also limited a more comprehensive perspective on comparative air power. The RCAF files appear to be in disarray with the disruption of the 1960s defence reorganization. Some degree of order returned with the establishment of Air Command in 1975, but those files are not yet accessible.⁹⁵

Personal papers – some of which have been used to publish biographies or memoirs – have filled in some of the gaps in official documents. The personal papers of Claxton provide a useful perspective on his tenure as MND. Unfortunately, the Curtis and the Dunlap papers do not offer much on their time as chiefs of the air staff. Furthermore, the complete absence of personal papers or memoirs by Slemon and Campbell are crucial gaps in the public record. For the later period of the 1970s and beyond, the Manson papers remain closed.

For the in-depth background development of NATO strategy during the 1950s, the NATO archives at SHAPE were of invaluable assistance.

Thesis Outline

This study is organized into seven chapters and an epilogue. Chapter 2 examines the general development of air power since 1945 to place the Canadian story in an international context, including the definition of air power and airpower functions, and the impact of technology, industry and economics. The focus of Chapter 3 is the development of air power in Canada up to 1950, with an emphasis on the beginnings of RCAF expansion during 1948-1950. Chapter 4 examines the build up of the RCAF contribution to NATO defence during the period

⁹⁵ Apart from published government annual defence reports, most information related to air force issues in the late 1960s and 1970s emanated from defence writer John Gellner in his monthly *Canadian Aviation* column.

1950-1957. It assesses the 5 February 1951 Defence Programme that set in motion the implementation of the Big Air Force concept. Though the emphasis is on No. 1 Air Division, its place in NATO, and the impact on Canada of changing NATO strategy, the chapter also details the Canadian contribution to the Korean War. Chapter 5 treats the build up of the home – based RCAF during the period 1950-1957. The focus will be on the implementation of the air staff's Plan H towards realization of the Big Air Force concept in Canada. Chapters 6 and 7 consider the decline and ultimate demise of the Big Air Force during the Diefenbaker government from 1957 to 1963 and the Pearson government from 1963 to 1968. The Epilogue concludes the study with a summary of the fate of the air force during the remaining Cold War years. It covers the period from 1969 to 1991 with the Trudeau and Mulroney governments, including the air force's partial recovery after the indecision, confusion and uncertainty of the Diefenbaker-Pearson decade and the early Trudeau years.

This study represents an examination of the role played by Canadian air power during a critical period of the nation's history. Within this Canadian context, national leaders from all backgrounds often failed to comprehend the linkages between politics, strategy and technology, and how these inter-related factors had a profound effect on the development of Canadian defence policy.⁹⁶ This study illustrates a consistent trend in the development of Canadian air power and its contribution to Canadian defence. The RCAF had a major strategic defence role in Europe and North America during the 1950s, but rapid technological changes greatly diminished that role by the early 1960s. As succinctly noted by aviation historians Stephen J. Harris and Robin Higham, "Service doctrine that is not in harmony with government policy is likely to

⁹⁶ See for example a discussion of the political context of British air power, a subject that has been absent from Canadian research, Michael Clarke, "The Political Context of Air Power in the United Kingdom," in Peter W. Gray (ed.) *British Air Power*, Defence Studies (Royal Air Force) Joint Doctrine and Concepts Centre Shrivenham, London: The Stationery Office, 2003.

produce circumstances in which air forces will fail; government policy made in isolation of service capabilities tends to do the same.”⁹⁷ The particular strategic and political circumstances of the early to mid 1950s brought such harmony, and made the Big Air Force a reality, but that harmony proved fragile in the face of profound and fast-paced change in the late 1950s and 1960s.

⁹⁷ Robin Higham and Stephen J. Harris, *Why Air Forces Fail: The Anatomy of Defeat*, Lexington: The University Press of Kentucky, 2006, p. 348.

Chapter 2

The Evolution of Air Power since the Second World War

From its nascent form during the First World War until its partial demise in the late 1960s, air power very much reflected the Western way of war. The origins of the concept of independent air power lay in revulsion at the heavy casualties incurred in the land battles of the First World War, a faith in technology, and a conviction that aviation offered a relatively bloodless way of striking at the enemy, and producing victory. In a similar manner, the inconclusive ground war in Korea, in contrast to the apparently decisive results of the nuclear attack on Japan in 1945, brought renewed emphasis on strategic air power by Western powers in the decade after the Korean War armistice, not least because it seemed the only answer to the superiority of the Soviet bloc in ground forces. Throughout this post-Second World War period, the importance of each of the three thematic pillars, politics and economics, military strategy and technology, varied over the course of time. This often reflected reactive policy on the part of governments due to rapidly changing military strategic and technological factors that in turn presented a fiscal challenge for implementation.

The Changing Meanings of “Air Power”

Proponents of air power have often used the term without explaining its meaning or deliberately using vague language that implies greater capabilities than can be achieved in reality. Steve Call, in *Selling Air Power: Military Aviation and American Popular Culture after World War II*, captures such a promotional effort in his description of the closing scene of the 1955 movie, *The Court-Martial of Bill Mitchell*. This movie deals with the 1925 trial of Brigadier-General William Mitchell, an early advocate of air power. The final scene in the movie has Mitchell leaving the courthouse and looking up at the sky, where “he looks up at a

formation of biplanes...as that image morphs into a formation of *F-86 Sabre* jets flying a starburst maneuver....”¹ Another film released in 1955, *Strategic Air Command*, includes dramatic film footage of the U.S. Air Force *B-36 Peacemaker* intercontinental strategic bomber, and equally loving footage of the *B-47 Stratojet* all-jet bomber.² Clearly, the intent of these 1950s films was to inculcate airmindedness among the general population. In writings on aviation even prior to the First World War, however, the term, “air power” was employed without a clear explanation. The first recorded use of the term was attributed to science-fiction writer H.G. Wells’ 1908 novel, *The War in the Air*: “The massed aeronautics park that had been established...to give Germany...the air power and the empire of the world.”³ In 1909, naval affairs journalist Fred T. Jane wrote, “Air power can hardly be more than one of many factors in deciding the issue of future wars.”⁴ During the inter-war period, the thinking of that triumvirate of early air power theorists, Giulio Douhet, Hugh Trenchard and Billy Mitchell dominated the “air power debate” with their very large claims for the military potential of aircraft, specifically for strategic bombing in the case of Douhet and Trenchard, and more generally on the part of Mitchell’s advocacy of multi-purpose air forces.⁵

Early in the Cold War, the *RAF War Manual – Part 1 – Operations*, AP 1300 (March 1950) explained, “Air power means the use of the air to enforce the national will.”⁶

Furthermore, the manual proceeded to declare “...air power is the determining factor in modern

¹ Steve Call, *Selling Air Power: Military Aviation and the American Popular Culture after World War II*, College Station, TX: Texas A&M University Press, 2009, p. 1.

² Ibid. p. 115-119.

³ Air Vice Marshal Tony Mason, *Air Power: A Centennial Appraisal*, London: Brassey’s (UK) Ltd, 1994, p. 1.

⁴ Ibid.

⁵ See Phillip S. Meilinger, “Giulio Douhet and the Origins of Airpower Theory,” and “Trenchard, Slessor, and Royal Air Force Doctrine before World War II, and Mark A. Clodfelter, “Molding Airpower Convictions: Development and Legacy of William Mitchell’s Strategic Thought,” in Phillip S. Meilinger (ed.) *The Paths of Heaven: The Evolution of Airpower Theory*, The School of Advanced Airpower Studies, Maxwell Air Force, Alabama: Air University Press, 1997.

⁶ Air Ministry. *Royal Air Force War Manual – Part 1 – Operations*, AP 1300, January 1950, p. 19.

war.”⁷ In developing air power, the composition of the Air Force was based upon “the primary agent of Air Power is the strategic bomber....”⁸ The manual did recognize that a balanced Air Force had to include the other five main components, namely, “Fighter, Tactical Air Force, Maritime, Photo Reconnaissance, and Transport Squadrons.”⁹ The RCAF Officers’ Examinations Study Material, *Readings in Air Power*, published in 1955, provided insights into Canadian conceptions of air power. In an address to the Montreal United Services Institute in 1952, Air Commodore Clare L. Annis pointed out that the “first and main role of air forces is to destroy enemy air power, and that the second stage of this main role is then to exploit the air over the enemy’s heartland with air weapons.”¹⁰

RAF Air Vice Marshal Tony Mason noted that the question of “what is air power” has continued to occupy air power thinkers through to the present day.¹¹ Over the course of the past half-century, a more limited and restrained approach to the use of the term “air power” has evolved. For example, in the 1999 edition of *British Air Power Doctrine*, AP 3000, air power was defined as “the ability to project military force in air or space by or from a platform or missile operating above the surface of the earth. Air platforms are defined as any aircraft, helicopter or unmanned air vehicle.”¹² Similarly cautious is the 2007 publication *Canadian Forces Aerospace Doctrine*: “aerospace power – that component of military power that is applied within or from the aerospace environment to achieve effects above, on and below the

⁷ Ibid.

⁸ Ibid.

⁹ Ibid.

¹⁰ Air Commodore Clare L. Annis, “The Role of the Air Forces,” Address delivered before the Montreal United Services Institute, 21 February 1952, from *Readings in Air Power*, RCAF Officers’ Examinations Study Material, Issued on the Authority of the Air Officer Commanding Training Command, May 1955, p. 1. See also Air Commodore C.L. Annis, “The Significance to Air Defence of Some Recent Technical Trends,” Address to the Montreal Air Force Veterans’ Association, 12 November 1954.

¹¹ Mason, *Air Power: A Centennial Appraisal*.

¹² Ministry of Defence, *British Air Power Doctrine* (AP 3000) 3rd ed. 1999, p. 1.2.1.

surface of the earth.”¹³ In a later 2009 edition of the British AP 3000 publication, air (and now space) power is defined as “the ability to project power from the air and space to influence the behaviour of people or the course of events.”¹⁴ Looking back to 1950, it can be seen that the promoters and practitioners of air power during that era attributed a much greater importance to air power as the final arbiter in peace and war.

Air Power Functions

“Independent” air power consisted of five major operational functions that developed and evolved separately from one another as dictated by military circumstances during the First World War. The “control of the air” function evolved on two lines of development. Control of the air over the battlefield aimed at gaining local air superiority over the enemy so that friendly forces could engage in battlefield attack and reconnaissance/observation. The more challenging task of controlling national air space – air defence –involved the use of long-range detection equipment, aircraft, antiaircraft artillery, and searchlights coordinated by an extensive command and control system that featured a network of detecting stations, plotting rooms, and command centres linked by rapid communications. Ground attack included close air support (CAS), battlefield air interdiction (BAI) and tactical reconnaissance in support of the army. CAS involved the use of aircraft armed with machineguns and bombs in the direct support of the army, whilst BAI was the use of aircraft in a ground attack role aimed at striking the enemy’s rear area logistics installations, bridges, troop concentrations and other vital points. The use of aircraft as the “eyes of the army” in reconnaissance and observation, the original *raison d’être* for the employment of air power remained a key role, using aerial photography and wireless communications for artillery spotting. Long range bombing by an “independent” air force was aimed at striking at

¹³ Department of National Defence. *Canadian Forces Aerospace Doctrine*, B-GA-400-000/FP-000, Canadian Forces Aerospace Warfare Centre Production Centre, Trenton, Ontario, 2007, p. 60.

¹⁴ Ministry of Defence. *British Air and Space Power Doctrine* (AP 3000) 4th ed. 2009, p. 7.

the enemy's critical industrial and military targets, and civilian population centres. Aircraft conducted maritime operations that could include anti-submarine patrols, anti-shipping strikes against surface vessels, and coastal reconnaissance.¹⁵ The air transport function emerged in a rudimentary fashion during the inter-war period, mostly relying on converted bombers for this role.

These six air power functions matured during the Second World War, forming the basis for the conduct of air power in the post 1945 period.¹⁶ Their post-war application increased the demand for highly specialized aircraft with the exception of using fighters and bombers to fulfill the air reconnaissance function. Doctrine in all major air forces emphasized that air superiority – the defeat or at least suppression of the enemy air force – was the essential basis for the conduct of both offensive and defensive air operations.¹⁷

For the bomber offensive function, American and British strategic bomber experience in the Second World War informed much of the thinking about future operations.¹⁸ Increasingly complex technology and the associated costs limited the establishment and maintenance of strategic bomber forces to only a few nations in the post-war period. Only the US, the UK and

¹⁵ R.A. Mason, *Air Power: An Overview of Roles, Brassey's Airpower: Aircraft, Weapons Systems and Technology Series, Volume 1*, London: Brassey's Defence Publishers Ltd, 1987. Depending on the organizational structure of national armed forces, maritime operations often remained a naval air arm responsibility even after the establishment of an independent air force. The air transport function made its debut in Iraq during the 1920s and gained critical importance during the Second World War. However, it was not until after the Second World War that air transport gained an importance on par with other air power functions.

¹⁶ Royal Air Force War Manual, Part 1 – *Operations*.

¹⁷ Ibid. p. 21. In the Lees Knowles Lectures, Tedder wrote, "that air superiority was the prerequisite to all war-winning operations, whether at sea, on land, or even in the air." (p. 32) Tedder's comments on the importance of attaining air superiority are discussed in Tami Davis Biddle, *Rhetoric and Reality in Air Warfare: The Evolution of British and American Ideas About Strategic Bombing, 1914-1945*, Princeton: Princeton University Press, 2002, p. 283.

¹⁸ RAF War Manual – Part 1 – *Operations*, see Chapter 5, The Bomber Offensive. For a technical understanding of strategic bombing, see Air Chief Marshal Sir Michael Knight, *Strategic Offensive Air Operations, Vol. 8 Brassey's Air Power: Aircraft, Weapons Systems and Technology Series*, London: Brassey's (UK) Ltd, 1989. For a history of bombing in the post-war era, see David Wragg, *The Offensive Weapon: The Strategy of Bombing*, London: Robert Hale Limited, 1986, Chapter 8 – "Decline and Fall" and Kenneth P. Werrell, *Death From the Heavens: A History of Strategic Bombing*, Annapolis, MD: Naval Institute Press, 2009, Chapter 7, "The Post-war Era: The End of Propeller-Powered Bombers," pp. 155-176, and Chapter 8, "Between Korea and Vietnam: The Transition to Jets," pp. 180-206.

the USSR operated bombers for the delivery of nuclear weapons, and the unaffordable cost of bomber modernization brought the RAF to end this role by 1969.¹⁹

In air defence operations, Britain had gained considerable experience in strategic air defence during the Second World War, but neither the United States nor Canada had to contend with strategic air defence during the war.²⁰ From the late 1940s to the late 1950s, air defence developed to the peak of its post-war strength and prominence in national defence establishments.²¹ Initially, air defence methods and equipment resembled those used during the Battle of Britain in 1940, but the introduction of fast and high-flying jet aircraft necessitated the development of sophisticated new methods and technology.²² As air defence forces achieved their peak growth by the late 1950s, the nature of the threat changed from long-range strategic bombers to that of ICBMs. Air defence forces were greatly reduced in size and their role had changed from the active defence of urban areas/territorial air defence to that of acting as a trip-wire defence for strategic retaliatory forces.

With the emphasis on strategic bomber and air defence forces, tactical air forces in the post-war period were often neglected – except when needed for actual combat as in the Korean

¹⁹ It was not until the 1960s that France developed a medium bomber nuclear-armed capability for its *Force de frappe*, whilst a few nations including Australia maintained a conventional bombing capability. In the immediate post-war period, the RAAF used Avro *Lincoln* bombers that were replaced by *Canberra* light jet bombers in the 1950s that in turn were replaced by General Dynamics *F-111s* in the 1970s.

²⁰ The only enemy aircraft shot down by RCAF Home War Establishment aircraft was a Japanese *Zero* during the Kiska campaign in Alaska in 1942.

²¹ Numerous publications provide both a technical explanation and a history of air defence operations. For a technical understanding, see Group Captain M.B. Elsam, *Air Defence, Vol. 7 Brassey's Air Power: Aircraft, Weapons Systems and Technology Series*, London: Brassey's (UK) Ltd, 1989. Air superiority is closely associated with air defence – for a technical understanding, see Air Vice Marshal J.R. Walker, *Air Superiority Operations, Vol. 5 Brassey's Air Power: Aircraft, Weapons Systems and Technology Series*, London: Brassey's (UK) Ltd, 1989. For historical perspectives, see Peter Wykeham, *Fighter Command: A Study of Air Defence 1914-1960*, London: Putnam & Company, Ltd, 1960, especially Chapter 20, "The Jet Age," and Michael J. Gething, *Sky Guardians: Britain's Air Defence 1918-1993*, London: Arms and Armour Press, 1993, for the periods 1948 and 1958.

²² Kenneth Schaffel, "the U.S. Air Force's Philosophy of Strategic Defense: A Historical Overview," in Stephen J. Cimbala (ed.), *Strategic Air Defense*, Wilmington, DE: Scholarly Resources Inc, 1989, p. 15.

War.²³ This neglect was in direct contradiction to the importance tactical air support achieved during the Second World War, ultimately with the large Allied Tactical Air Forces that supported the land campaign in North-West Europe in the last year of the war.²⁴ Yet the development of dedicated ground attack aircraft in the post-war period was not a priority with air forces; usually older fighter aircraft were adapted for the roles of CAS, BAI and tactical reconnaissance in support of the army. The build up of NATO air forces during the 1950s included considerable tactical air power but the weaponry and techniques did not change significantly from the Second World War and Korea.

The Battle of the Atlantic during the Second World War demonstrated the vital importance of maritime air operations.²⁵ In this context, maritime air operations refer to the use of land based, fixed wing aircraft for anti-submarine warfare, anti-surface warfare (what has been referred to as anti-shipping), surveillance and subsidiary tasks such as air-sea rescue and meteorological reconnaissance.²⁶ Maritime air operations were often ignored during the post-war period despite the development of a large submarine fleet by the USSR. Modern aircraft design inevitably led to the development of specialized aircraft, as bombers were no longer suitable for maritime missions.²⁷

²³ See A Special Correspondent, "Aircraft Over the Battlefield: Lessons of the Korean Campaign," *Air Pictorial*, Vol. XV, No. 3, March 1953.

²⁴ See RAF War Manual – Part 1 – *Operations*, Chapter 8, Land-Air Warfare. For various studies detailing the importance of ground support during the Second World War, see Richard P. Hallion, *Strike from the Sky: The History of Battlefield Air Attack, 1911-1945*, Washington: Smithsonian Institution Press, 1989, Ian Gooderson, *Air Power at the Battlefield: Allied Close Air Support in Europe 1943-1945*, London: Frank Cass, 1998, and Ian David Hall, *Strategy for Victory: The Development of British Tactical Air Power, 1919-1943*, Westport, CT: Praeger Security International, 2008. For a technical understanding of modern air-to-ground operations, see Air Vice Marshal J.R. Walker, *Air-to-Ground Operations, Vol. 2 Brassey's Air Power: Aircraft, Weapons Systems and Technology Series*, London: Brassey's (UK) Ltd, 1987.

²⁵ See RAF War Manual – Part 1 – *Operations*, Chapter 7, Sea-Air Warfare. For a technical understanding, see Group Captain B.C. Laite, *Maritime Air Operations, Vol. 11 Brassey's Air Power: Aircraft, Weapons Systems and Technology Series*, London: Brassey's (UK) Ltd, 1991.

²⁶ *Ibid.* pp. 2-5, and RAF War Manual – Part 1 - *Operations*, Chapter 7.

²⁷ RAF War Manual – Part 1 – *Operations*, p. 19. The maritime patrol role was assigned to the US Navy, not the USAF, in which capacity the specialized *Neptune* was the primary maritime aircraft.

Though military air transport operations had become an essential function during the Second World War, it had low priority until the late 1950s.²⁸ Most long-range transports were military adaptations of civilian airliners such as the Handley Page *Hastings*, Canadair *North Star*, and Douglas *C-54* and *C-118*.²⁹ Only the USAF developed large numbers of heavy lift aircraft such as the *C-124 Globemaster*.³⁰ Most air forces were limited to a tactical capability using wartime twin-engine *Dakota* transports, supplemented by some larger twin-engine rear-ramp equipped *Flying Boxcar* transports.³¹

Air reconnaissance continued in importance after 1945.³² During the Second World War, this function evolved to consist of low flying tactical air reconnaissance and high flying strategic reconnaissance with the adaptation of existing fighter and bomber aircraft. Tactical reconnaissance by the USAF and the RAF was key in the support of army operations both in NATO and Korea.³³ The conduct of strategic reconnaissance, particularly into the vicinity of enemy airspace, was a US and British priority.³⁴

²⁸ See RAF War Manual – Part 1 – *Operations*, Chapter 9 – Air Transport Operations. For a technical understanding of military air transport operations, see Group Captain Keith Chapman, *Military Air Transport Operations, Vol. 6 Brassey's Air Power: Aircraft, Weapons Systems and Technology Series*, London: Brassey's (UK) Ltd, 1989. For a history, see David Wragg, *Airlift: A History of Military Air Transport*, Shrewsbury, UK: AirLife Publishing Ltd, 1986.

²⁹ These airliners lacking rear ramps and doors had major limitations as “side loaders” for the quick movement of materiel, let alone their unsuitability to carry and disembark paratroops. The introduction of the Lockheed *C-130 Hercules* did much to alleviate these limitations.

³⁰ The major limitation of the *C-124* was that it was a piston engine aircraft, so it was not very economical to operate.

³¹ See Kenneth P. Werrell, “The Dark Ages of Strategic Airlift: the Propeller Era,” *Air Power History*, Vol. 50, No. 3, Fall 2003. Apart from the USAF and the RAF, the RCAF was one of the few air forces that developed a strategic transport capability using the Canadair four-engine *North Star* aircraft.

³² See RAF War Manual – Part 1 – *Operations*, Chapter 10, Air Reconnaissance. For a technical understanding, see Group Captain G.J. Oxlee, *Aerospace Reconnaissance, Vol. 9 Brassey's Air Power: Aircraft, Weapons Systems and Technology Series*, London: Brassey's (UK) Ltd, 1997. See also RAF War Manual – Part 1 *Operations*, Chapter 10 – Air Reconnaissance. For a history, see Glenn B. Infield, *Unarmed and Unafraid*, New York: The Macmillan Company, 1970, Grover Heiman, *Aerial Photography: The Story of Aerial Mapping and Reconnaissance*, New York: The Macmillan Company, 1972, and Andrew Brookes, *Photo Reconnaissance*, London: Ian Allen Ltd, 1975.

³³ Infield, Chapter 9, “Air Reconnaissance in Korea.”

³⁴ See Paul Lashmar, *Spy Flights of the Cold War*, Stroud, UK: Sutton Publishing Limited, 1996. Specialized strategic reconnaissance aircraft such as the Lockheed *U-2* were developed in the early 1950s.

The analysis in Possony's *Strategic Air Power* of 1949 featured what he referred to as the fifteen elements of air power summarized in **Table 2-1** below.³⁵ These elements, which identify the essential building blocks of air power from a national perspective as well as particular service needs, are especially useful to understand Canada's situation in the early Cold War. They will inform the analysis in subsequent chapters.

Table 2-1 - Elements of Air Power	
Raw materials and fuels	Guided missiles and atomic weapons
Industrial potential, tool reserves and high rate of technological progress	Aircraft
Bases and protective forces	Manpower
Communications and electronics	Training
Logistics and supplies	Morale
Auxiliary services	Intelligence
Airborne forces	Research and inventiveness
Source: Stefan T. Possony, <i>Strategic Air Power</i> , p. 35	Tactics-Strategy-Planning

A nation that has access to the necessary raw materials to manufacture aircraft, along with guaranteed supplies of aviation fuel is obviously in a better strategic situation as an air power than a nation that is not – consider the tenuous position of Japan in the Second World

³⁵ Stefan T. Possony, *Strategic Air Power: The Pattern of Dynamic Security*, Washington: Infantry Journal Press, 1949, p. 35.

War, for example. In the case of industrial potential, which was vital to the expansion of the RCAF, Possony identified the following characteristics: high level of technology and inventiveness, organizational ability, the size of the aircraft industry, a capability for the rapid conversion of industry to aircraft and parts production, the size and productivity of the machine tool industry, efficient use of manpower, and effective cooperation between the air force and industry.³⁶ In the area of communications and electronics, radar was an essential aspect of the early warning system against air attack, in the Canadian case notable in the development of the three radar chains across the country during this period.

Auxiliary services included such aspects as aerial mapping and photographic services, meteorological services, aviation medicine, and the design and production of individual flying clothing and equipment that in many cases draws on the results of specialized medical research.³⁷ These were areas in which the RCAF had long-standing capabilities dating back to the earliest days of the service in the 1920s because of the extraordinary demands of flying operations in Canada's environment.

Although airborne troops in the case of Canada, the UK and the US belonged to the army rather than the air force, Possony saw them as contributing to air power because of the speed and mobility with which they could be deployed without reliance on airfields, though he noted their limited ability to hold ground. At the same time he remarked that "in arctic war they [airborne troops] are indispensable," a principal role of the Canadian Mobile Striking Force that will be discussed in subsequent chapters.³⁸

³⁶ Ibid. p. 37. These factors had been developed in Canada during the course of the Second World War, the only exception being that no aircraft engines had been manufactured during the war.

³⁷ Ibid. p. 39. Canada undertook significant research and development in aviation medicine with its RCAF Institute of Aviation Medicine. See Peter Allen, "The Remotest of Mistresses: The Franks Flying Suit," *CAHS Journal*, Vol. 21, No. 4, Winter 1983.

³⁸ Possony, p. 40.

Possony considered the atomic bomb to be “an air power weapon.” During the period treated in the present study nuclear weapons became an overriding consideration in war planning and in the development of the RCAF.³⁹

Though air power is more than simply airplanes, aircraft are the essential element based on a combination of quantity, quality, and specialization. In Possony’s estimation, “approximately six planes are needed for every plane serving at the front.”⁴⁰ However there was the conundrum between the issue of quantity versus quality resulting from the increasing technological complexity and increased cost of aircraft. The need for specialized aircraft added to the quantity and quality of aircraft required for a balanced air force, which raised increasingly lofty hurdles for all air forces during the early Cold War.

According to Possony “manpower is one of the chief conditions of aerial victory.” Apart for the need for multiple flying crews for each aircraft, there is a need to ensure an adequate supply of manpower amounting to 25 to 30 personnel to support each flyer.⁴¹ The efficient use of reserve force personnel is an obvious requirement, as is effective flying training and ground trades training to supply sufficient personnel with the right qualifications in a timely fashion. The training imperative was clearly recognized by the Allies during the Second World War with the British Commonwealth Air Training Plan, and its success was repeated albeit on a much smaller scale with NATO flying training in Canada during the Cold War.

³⁹ Ibid. p. 40. The planning and conduct of air operations under nuclear conditions even for a conventionally armed air force such as the RCAF in the 1950s was a constant consideration.

⁴⁰ Ibid. p. 40.

⁴¹ Ibid. p. 42. The effective use of a national manpower was an issue close to Canada. See for example, Lieutenant General E.L.M. Burns, *Manpower in the Canadian Army 1939-1945*, Toronto: Clarke, Irwin & Company Limited, 1956. For an examination of the RCAF’s Second World War experience, see J. Mackay Hitsman, “Manpower Problems of the Royal Canadian Air Force during the Second World War,” Ottawa: AHQ Report, No. 67, 15 January 1954 <http://www.cmp-cpm.forces.gc.ca/dhh-dhp/his/rep-rap/doc/ahqr-rqga/ahq067.pdf> [Accessed 8 September 2013].

Morale, one of the foundations of military effectiveness, consists of tangible and intangible items such as belief in a cause, conditions of service that develop an esprit de corps, and a belief that one has a chance of survival.⁴² Though the Cold War flyers did not have the high loss rates of the Second World War (especially in RAF Bomber Command), flying in the Korean War and in the Cold War was still a risky and dangerous business.

The importance of intelligence has often been ignored or underrated in studies of Canada's Cold War forces. Weak air intelligence during this period resulted in a number of surprises for Western nations, including an underestimation of Soviet aircraft such as the *MiG-15*, overestimating Soviet bomber development and the threat to North America, and underestimating the Soviet missile threat.

According to Possony, "Technical superiority is perhaps the most important single condition upon which the outcome of aerial warfare depends."⁴³ The basic problem of how to organize research in order to achieve this technological superiority represents the greatest challenge, not least because it may impinge on the existing organization and its "sacred cows," resulting in resistance to new equipment and methods.⁴⁴ The battle between bombers and missiles was representative of such a struggle. More generally, dramatic shifts in Western alliance strategy (and tactical roles derived from that strategy) that were driven in no small part by technological change were to have an enormous impact on the RCAF's leadership and planning – Possony's final element – after 1957.⁴⁵ Taken as a whole, Possony's fifteen elements

⁴² Possony, pp. 42-43.

⁴³ Ibid. p. 43. Possony later published a book on the importance of military technology. See Stefan T. Possony and J.E. Pournelle, *The Strategy of Technology: Winning the Decisive War*, Cambridge, MA: University Press of Cambridge, 1970.

⁴⁴ Richard Overy, *The Air War 1939-1945*, Chelsea, MI: Scarborough House Publishers, 1981, Chapter 8 – "Science, Research and Intelligence."

⁴⁵ Possony, pp. 45-46. The intertwined factors of strategic planning and leadership were to have an enormous impact on the RCAF particularly after 1957.

describe what was embraced by the RCAF's Big Air Force concept, and help to pinpoint how changes in the international and domestic situation led to the demise of that ambition.

Technology, Industry and Economics

The atomic bomb, jet propulsion, rockets and radar were the principal technologies to emerge from the Second World War that profoundly affected post-war air power.⁴⁶ Apart from these advanced technologies, aircraft development underwent rapid changes in terms of performance, materials, and production during the Second World War. In the first decade of "jet power" from 1945 to 1955, aircraft technology underwent more revolutionary changes compared to the previous decade.⁴⁷ In the late 1940s, though piston-engine fighters such as the *Spitfire*, *Mosquito* and *F-51 Mustang* remained the mainstay of Western air forces, they were supplemented and then replaced by early British jet fighters, the Gloster *Meteor* and the De Havilland *Vampire*, that had both appeared in the later stages of the Second World War. These aircraft remained in service in several western air forces until well into the 1950s, albeit in improved versions.⁴⁸

In contrast to international sales of the *Vampire* and *Meteor*, the United States' first effective jet fighter, the Lockheed *F-80 Shooting Star*, had only limited export success, though it did ultimately reach wider markets as an advanced jet trainer, the *T-33*, including licensed production by Canadair for the RCAF.⁴⁹ The *F-80* was supplemented by the Republic *F-84*

⁴⁶ Guy Hartcup, *The Effect of Science on the Second World War*, Basingstoke: Palgrave Macmillan, 2003. These specific technologies were mentioned by General Henry H. Arnold in the Third Report to the Secretary of War by the Commanding General of the Army Air Forces, 12 November 1945 – see General Henry H. Arnold, "Air Power and the Future," in Eugene M. Emme, *The Impact of Air Power: National Security and World Politics*, Princeton, NJ: D. Van Nostrand and Company, Inc, 1959, pp. 309-312.

⁴⁷ Mike Spick, *Jet Fighter Performance: Korea to Vietnam*, London: Ian Allan Ltd, 1986.

⁴⁸ Francis K. Mason, *The British Fighter since 1912*, London: Putnam Aeronautical Books, 1992

⁴⁹ Spick, pp. 31-32. See also Robert F. Dorr, "Lockheed F-80 Shooting Star," *Air Power History*, Vol. 37, No. 4, Winter 1990.

Thunderjet fighter-bomber in USAF service.⁵⁰ The *F-80* and *F-84* were straight-wing jet fighters, but with the flight of the North American *F-86 Sabre* prototype in 1947, the US swept significantly ahead of the British in fighter development.⁵¹ Relations between the UK and the US were decidedly cool in the immediate post-war period, and in the case of the aircraft industry, there was open competition between the industries of the two nations.⁵² Relations reached their lowest point in 1946 when the Atlee government authorized the sale of the Rolls-Royce *Nene* turbojet engine to the USSR that were used to power the Mikoyan *MiG-15* jet fighter.⁵³

The USAF was not well served by its early all-weather interceptor aircraft. The Northrop *F-89 Scorpion* was the first attempt to produce a twin-seat all-weather fighter, but this aircraft had considerable shortcomings.⁵⁴ The Lockheed *F-94 Starfire*, an all-weather two-seat radar equipped development of the *F-80* was another design that had serious limitations resulting in the development of the *F-86* air superiority fighter as a one-man all-weather interceptor in its *F-86D* version, albeit with limitations in this role. In the case of all three interceptors, they adopted the superior “collision course interception” utilizing 2.75 inch folding fin aircraft rockets (FFARs) rather than the traditional “pursuit course interception” that involved attacking the bomber from the rear.⁵⁵ Subsequent developments included the single seat *F-102 Delta Dagger*

⁵⁰ Spick, pp. 31-32. See also “NATO’s First Sting: The Republic Thunderjet was ‘founder’ of Western European tactical air power,” *Royal Air Force Flying Review*, Vol. 16, No. 11, July 1961.

⁵¹ Duncan Curtis, *North American F-86 Sabre*, Marlborough, UK: The Crowood Press Ltd, 2000. Similar British aircraft such as the Supermarine *Swift* and Hawker *Hunter* prototypes did not fly until the early 1950s.

⁵² Jeffrey A. Engel, *Cold War at 30,000 Feet: The Anglo-American Fight for Aviation Supremacy*, Cambridge, MA: Harvard University Press, 2007.

⁵³ *Ibid.*

⁵⁴ Spick, *Jet Fighter Performance*, p. 48.

⁵⁵ *Ibid.* pp. 47-50.

supersonic interceptor that also had its share of problems, and eventually the twin seat *F-101 Voodoo* and single seat *F-106 Delta Dart* by the late 1950s.⁵⁶

In the RAF, cannon-equipped two-seat radar equipped all-weather/night fighter versions of the standard *Vampire/Venom* and *Meteor* were used being replaced with the more modern Gloster *Javelin* all-weather fighter in 1956.⁵⁷ The first US supersonic fighter, the North American *F-100A Super Sabre*, first flew in 1953; its British counterpart, the English Electric *Lightning* did not fly supersonic until 1958. The *F-100*, used primarily as a fighter-bomber, was soon followed with other second generation “Century fighters” including the *F-101 Voodoo*, *F-102 Delta Dagger*, *F-104 Starfighter*, *F-105 Thunderchief* and *F-106 Delta Dart*.⁵⁸ From the start the *F-102* and *F-106* were designed to serve as single-seat interceptors. The *F-101* was originally designed as an escort fighter and fighter-bomber, but it gained its prominence in the interceptor and reconnaissance roles. The *F-104* was originally designed as a high altitude interceptor for the USAF, but it was to serve in much larger numbers with allied air forces primarily in the low-level nuclear strike-reconnaissance and fighter-bomber roles.⁵⁹ The *F-105* represented the “New Look” tactical fighter-bomber that included an internal bomb bay designed to carry small nuclear weapons.⁶⁰

Despite the institutional focus on bombers as the key aircraft in the air force, post-war bomber development was much more limited. Until 1950, the Avro *Lincoln* provided the RAF with its principal heavy bomber capability despite being a marginal improvement over the

⁵⁶ See Mark Lorell, *The Cutting Edge: A Half Century of U.S. Fighter R & D*, Santa Monica, CA: RAND Corporation, 1998, http://www.rand.org/pubs/monograph_reports/MR939/ [Accessed 12 March 2007].

⁵⁷ Mason, *The British Fighter*, pp. 376-381.

⁵⁸ David Donald (ed.), *Century Jets: USAF Frontline Fighters of the Cold War*, Norwalk, CT: Airtime Publishing Inc, 2003.

⁵⁹ Martin W. Bowman. *Lockheed F-104 Starfighter*, Marlborough, UK: The Crowood Press Ltd, 2000.

⁶⁰ See Peter Davies, “Republic F-105 Thunderchief: The Backbone of the Tactical Air Force,” *Aeroplane*, Vol. 41, No. 8, August 2013.

wartime *Lancaster*.⁶¹ Britain may have lagged in the development of jet fighters, but the British produced the finest light bomber in the post-war period. The English Electric *Canberra* first flew in 1951 and was produced in bomber, intruder and reconnaissance versions. Apart from its export to fifteen nations, the *Canberra* was also unique in that it was adopted by the USAF and licence-built in the US.⁶² In light bomber development, the US did not fare well in the immediate post-war period producing the four engine *B-45 Tornado* light jet bomber that failed as a bomber though some were utilized in the reconnaissance role.⁶³ In the Korean War, it was the *B-26 Invader* from the Second World War that dominated the light bomber squadrons.

The *B-29* formed the basis for the USAF Strategic Air Command (SAC) in the immediate post-war period, but it was the massive *B-36 Peacemaker* whose development had begun during the war that was intended to be the premier bomber.⁶⁴ Although capable of intercontinental range, the *B-36*, too slow to successively penetrate Soviet airspace, was supplemented by the *B-50*, an improved version of the *B-29*.⁶⁵ The 2,000 *B-47 Stratojets*, the first American all-jet strategic bomber dominated SAC during the 1950s.⁶⁶ First flown in 1952, the *B-52* entered service in 1956 and represented the zenith of US strategic bomber development.⁶⁷ The high altitude Mach 2 *B-58 Hustler* bomber appeared in the late 1950s post-*Sputnik* period, but saw only limited service for a decade until being retired by 1970.⁶⁸ For the RAF, the development of long-range strategic bombers to carry the British nuclear deterrent was based on four separate

⁶¹ Francis K. Mason, *The British Bomber since 1914*, London: Putnam Aeronautical Books, 1994, pp. 355-358.

⁶² Barry Jones. *English Electric Canberra and Martin B-57*, Marlborough, UK: The Crowood Press Ltd, 1999.

⁶³ John C. Fredriksen, *The B-45 Tornado: An Operational History of the First American Jet Bomber*, Jefferson, NC: McFarland & Company Inc, Publishers, 2009.

⁶⁴ Marcelle Size Knaack, *Encyclopedia of U.S. Air Force Aircraft and Missile Systems, Volume II – Post-World War II Bombers 1945-1973*, Washington, DC: Office of Air Force History, United States Air Force, 1988, pp. 3-54.

⁶⁵ Ibid. pp. 161-200.

⁶⁶ Ibid. pp. 99-156. See also George A. Larson, "Boeing's B-47 Stratojet," *Journal of the American Aviation Historical Society*, Vol. 44, No. 3, Fall 1999.

⁶⁷ Knaack, pp. 205-292

⁶⁸ Ibid. pp. 351-397.

designs from Shorts, Vickers, Avro and Handley-Page.⁶⁹ The Shorts *Sperrin* was quickly dispensed with, and the Vickers *Valiant*, Avro *Vulcan* and Handley-Page *Victor* (the “V-bombers”) became the focus of Bomber Command.⁷⁰

The launch of *Sputnik* was to have a double effect on future fighter and bomber development. In the case of fighters, it was becoming apparent that the Soviet bomber threat was not as critical as previously perceived; therefore it was redundant to undertake massive investment in air defence. Various interceptors were cancelled including the North American *F-108 Rapier* and Republic *XF-103* in the US, the Saunders-Roe *SR.177* in the UK and the Avro *CF-105 Arrow* in Canada.⁷¹ The proposed British *Avro 730* supersonic bomber was cancelled in 1957, but it was not until the 1962 that the high altitude Mach 3 North American *XB-70A Valkyrie* was cancelled.⁷²

Numerous improvements in all aspects of aircraft technology occurred during the 1945-55 period, but there were only limited changes in aircraft armaments, particularly in conventional weaponry as fighter aircraft continued with gun armament. For the USAF, the 0.50 inch machinegun was still the preferred gun armament though it was now recognized (and borne out by Korean War experience) that this weapon was inadequate for modern air-to-air warfare.⁷³ RAF aircraft already used 20mm cannon as standard, and by the 1950s, aircraft such as the Hawker *Hunter* were armed with the 30mm cannon as the new standard. With the adoption of

⁶⁹ Mason, *The British Bomber since 1914*.

⁷⁰ Andrew J. Brookes, *V-Force: The History of Britain's Airborne Deterrent*, London: Jane's, 1982. Both the RCAF and RAAF included the Avro *Vulcan* on their “wish-list” for potential aircraft procurement.

⁷¹ See Dennis R. Jenkins, “The Titanium Titan: The Story of the XF-103 – Republic's Elusive Mach 3 Fighter,” *Airpower*, January 2004, Dennis R. Jenkins and Tony R. Landis, “F-108 Rapier: The Elusive Mach 3 Interceptor,” *Airpower*, September 2004, and E.R. Johnson, “Aerial Oddities (XF-108 Rapier),” *Aviation History*, Vol. 17, No. 1, September 2006. Derek Wood, *Project Cancelled: A Searching Criticism of the Abandonment of Britain's Advanced Aircraft Projects*, London: Macdonald and Jane's, 1976, and “Death of a Fighter,” *Royal Air Force Flying Review*, Vol. 13, No. 7, March 1958.

⁷² Wood, pp. 130-148, and Knaack, pp. 559-574. The *XB-70A* test programme continued until 1969

⁷³ Mike Spick, “The Fighter: A Provocative View of Four Decades of Fighter Development,” *Air International*, Vol. 28, No. 6, June 1985, p. 316.

the *M61 Vulcan* 20mm rotary cannon by the late 1950s, USAF aircraft finally acquired suitable gun armament.⁷⁴ Though initially equipped only with machineguns, the eventual preferred weapon for American and Canadian jet interceptor fighters was the 2.75 inch Folding Fin Air Rocket (FFAR) fired in salvos by the aircraft on a collision course interception with the enemy bomber.⁷⁵ Guided air-to-air missiles entered service only in the late 1950s included the infrared homing *Sidewinder* and both infrared and radar versions of the *Falcon*.⁷⁶ A nuclear-armed unguided air-to-air rocket, the *Genie*, was produced for USAF use against enemy bombers.⁷⁷ Conventional air-to-ground weaponry did not change during this period from the ordnance of the Second World War, consisting of free-fall bombs of various sizes (usually a pair of 500 pound or 1000 pound bombs on a fighter-bomber) and 5 inch High Velocity Air Rockets (HVAR). Air-to-ground weapons delivery methods remained the same as conducted during the Second World War. It was in the area of nuclear weapons where miniaturization enabled their carriage by fighter aircraft such as the *F-84 Thunderjet* for example.

The trend had been for larger and more complex combat aircraft that were also more expensive. To reverse this trend and increase the numbers of available of combat aircraft, NATO issued a requirement in 1954 for a “lightweight fighter.”⁷⁸ The term “lightweight fighter” was interpreted to mean a less capable aircraft so that there was no strong interest in adopting this type of aircraft. The competition resulted in nine designs being submitted including five French,

⁷⁴ Anthony G. Williams and Emmanuel Gustin, *Flying Guns: The Modern Era – The Development of Aircraft Guns, Ammunition and Installations since 1945*. Ramsbury: The Crowood Press Ltd, 2004, and Bill Gunston, *The Illustrated Encyclopedia of Aircraft Armament: A Major Directory of Guns, Rockets and Missiles, Bombs, Torpedoes and Mines*, New York: Orion Books, 1988.

⁷⁵ Mike Spick, “The Fighter: A Provocative View of Four Decades of Fighter Development – Part 2,” *Air International*, Vol. 29, No. 1, July 1985, p. 29.

⁷⁶ *Ibid.* p. 30.

⁷⁷ *Ibid.*

⁷⁸ Robert Jackson, *Cold War Prototypes*, Marlborough, UK: The Crowood Press, 2005. See Chapter 17, “Lightweight Fighters.”

two Italian and two British proposals.⁷⁹ The winner of the competition was the Italian Aeritalia *G.91* that was adopted only by Italy, Germany and Portugal, but rejected by both Greece and Turkey.⁸⁰

The development of more complex aircraft also increased the maintenance requirements for air forces both in terms of the length of time that an aircraft might be unserviceable and the number of specialized maintenance personnel required. Aircraft could no longer be repaired with some sheet metal and scissors, but rather required extensive repair of the numerous “black boxes” that were described as:

...Large, bulky and felt like a ton weight, and they were packed with valves basically like those in old-fashioned radios which consumed kilowatts of power, pumped out heat and went wrong at the drop of a hat.... The MTBF (mean time between failures) was often in single figures, and when something went wrong it took hours of tracing and with luck, rectification by fiddling work with screwdrivers and even soldering irons.⁸¹

Similarly, the introduction of jet engines added new problems as the early jet engines had a very short life span compared to piston engines, in some cases as low as fifty hours.⁸²

In the post-war period, the aircraft industries continued to enjoy government largesse related to the funding of the development and production of numerous aircraft projects.⁸³ In the case of the UK, the duplication of various designs came to an end with the Defence White Paper

⁷⁹ Ibid. p. 129.

⁸⁰ Ibid. See Riccardo Niccoli, “Gina’s Story: The Aeritalia G.91 Family,” *Air Enthusiast*, No. 65, September-October 1996. Losing aircraft designs however did have a future – The British Folland *Gnat* found success primarily with the Indian Air Force, the Dassault *Entendard* with the French Navy and the Breguet *Taon* formed the basis for the Anglo-French SEPECAT *Jaguar* aircraft. The concept of lightweight fighters did not disappear as the *F-16* in the 1970s was originally conceived as a less expensive “lightweight fighter.” However, it appears that most advanced air forces want as much capability as possible built into their combat aircraft resulting in the continued development and production of heavy and complex aircraft.

⁸¹ Bill Gunston, *Fighters of the Fifties*, Cambridge: Patrick Stephens Limited, 1981, p. 7.

⁸² David Edgerton, *The Shock of the Old: Technology and Global History since 1900*, New York: Oxford University Press, 2007, p. 88. Edgerton cites the example of Pratt & Whitney *Twin Wasp* piston engines that powered the *Dakota* with a life of 1500 hours compared with the *General Electric J-47* jet engine (that powered the *Sabre* fighter) when introduced in the early 1950s had a life of 50 hours though this had improved to 650 hours by mid-decade.

⁸³ See Mark Lorell, *The U.S. Combat Aircraft Industry 1090-2000: Structure, Competition, Innovation*, Santa Monica: RAND Corporation, 2003. For the plethora of combat prototypes produced by various nations, see Jackson, *Cold War Prototypes*.

in 1957 that prematurely predicted the end of manned combat aircraft.⁸⁴ This resulted in an industry rationalization that by the mid 1960s saw the existence of two major aircraft conglomerates, the British Aircraft Corporation and Hawker Siddeley Aviation.⁸⁵ In the US, a similar situation existed and a number of aircraft companies could no longer compete, resulting in their demise or amalgamation with their more robust competitors.

Closely associated with the political dimension was the constant issue of defence economics, as air forces were creations of governments. Defence economics was a key factor particularly as air forces were much more expensive to equip, train and operate compared to armies, and the rapid advance of technology during this period soon made expensive investments in air force equipment obsolete. The end result of the sharply rising costs was that each successive generation of designs saw fewer and fewer aircraft entering service, a case of budgets dictating a hard choice between quality and quantity.⁸⁶ The increasing cost of aircraft was an issue in the early 1950s, even prior to the production of the more complex second and third generation fighters that emerged during this decade.⁸⁷ The utilization of cheaper aircraft particularly for

⁸⁴ See Martin Edmonds, "The Future of Manned Aircraft," in John Erickson (ed). *The Military-Technical Revolution: Its Impact on Strategy and Foreign Policy*, Washington, DC: Frederick A. Praeger Publishers, 1966.

⁸⁵ There has been no shortage of studies on the British post-war aircraft industry, in the case of the US, not so much. For the British aircraft industry, see Sir Roy Fedden, *Britain's Air Survival: An Appraisal and Strategy for Success*, London: Cassell & Company Ltd, 1957, Arthur Reed, *Britain's Aircraft Industry: What Went Right, What Went Wrong*, London: J.M. Dent & Sons Ltd 1973, and Derek Wood, *Project Cancelled*, 1975, Ian Cheeseman, Martin Edmonds and John Simpson, "The Procurement of Military Combat Aircraft, 1945-70," in E.J. Feuchtwanger (ed). *Perspectives Upon British Defence Policy 1945-1970*, Southampton: University of Southampton, April 1974, Keith Hayward, *The British Aircraft Industry*, Manchester: Manchester University Press, 1989, and James Hamilton-Patterson, *Empire of the Clouds: When Britain's Aircraft Ruled the World*, London: Faber and Faber Limited, 2010. For the US aircraft industry, see Charles D. Bright, *The Jet Makers: The Aerospace Industry from 1945 to 1972*, Lawrence, KS: The Regents Press of Kansas, 1978.

⁸⁶ Though the costs of aircraft increased due to the complexity and sophistication of their electronics, weapon systems and materials, there was a life cycle costs of lower maintenance due to the increased reliability. See Edgerton, Chapter 4.

⁸⁷ See James Hay Stevens, "Need Military Aircraft be so Costly?" *Air Pictorial*, Vol. XV, No. 11, November 1953, and "Need Military Aircraft Be So Costly – Part 2 – Lighter Fighters," *Air Pictorial*, Vol. XV, No. 12, December 1953.

ground attack remained an issue, especially in light of their need in the Korean War.⁸⁸ The search for the right combination of costly complex aircraft and cheaper less sophisticated types (a “high” and “low” mix) was a constant struggle.⁸⁹

Conclusions

Viewed from the perspective of the three intertwined pillars of defence and economics, military strategy and technology, the post Second World War period was one of tremendous change and rapidly shifting priorities. In the immediate post-war years, fiscal restraint and the deep retrenchment of existing forces limited the modernization of air power. New technology such as nuclear weapons, jet fighters and rockets had yet to have a discernible impact, and there was little impetus for military strategy to embrace these potential “game changers.”. Despite the emergence of the Cold War in the late 1940s, the catalyst for increased defence spending – and the essential support for this spending by national governments – came from the outbreak of the Korean War in 1950. However, the financial strain of what amounted to permanent mobilization led to a new military strategy based on the use of nuclear forces rather than large conventional forces. Reliance on nuclear weapons as a first response to aggression ultimately proved to be inflexible and dangerous, and ineffective in dealing with “brushfire wars” that threatened the balance between East and West. Thus the western powers complemented their nuclear forces with some expansion of conventional military forces in the 1960s. In fact, combat in the small

⁸⁸ See John W.R. Taylor, “Economy in Ground Attack,” *The Royal Air Force Quarterly and Commonwealth Air Forces Journal*, Vol. 5, No. 1, January 1953, and Howard S. Fowler, “Ground Attack,” *Air Pictorial*, Vol. XV, No. 4, April 1954.

⁸⁹ See Michael Handel, “Numbers Do Count: The Question of Quality Versus Quantity,” *Journal of Strategic Studies*, Vol. 4, No. 3, September 1981. In contrast, see Possony’s comment that “quantitative relationships are less important in aerial warfare...” (p. 34). However, Possony was alluding to the elements of air power that provide those other qualitative factors.

wars of the 1950s and 1960s relied on modernized Second World War equipment or the adaptation of more modern equipment for conventional operations.

The experience during the two World Wars and in the post-1945 period clearly demonstrated the importance of air power. However, the promises by the air power theorists about its decisive impact were not substantiated. Historian Michael Howard noted,

So long as there are these three elements in which war must be fought, there will be a need for three armed services, each exercising their own skills and their own specialty. But they can only serve a single, coordinated strategy, in which air power will play its appropriate part. Air power, as such, will not by itself win wars.⁹⁰

Air mindedness was the driving force for the prominence for air power during the early post-war Second World War period. The air power functions had matured with this wartime experience. Though the union of jet powered bombers and nuclear weapons in the 1950s represented the apogee of air power for the RAF Bomber Command and the USAF Strategic Air Command, it was by no means the sole focus of air power. Though the strategic bomber persisted as the institutional focus for the RAF and the USAF, and to a much significantly lesser degree by the Soviet *Dalnaya Aviatsiya*, most air forces were focused on the tactical air defence and close air support functions. The exception was the strategic air defence function conducted by the RCAF and the Royal Swedish Air Force (RSAF). However, it was Mitchell's "anything that flies" approach to air power that proved its usefulness rather than the "Douhet with nukes" or a conventional bombing strategy. Conventional bombing was employed by both the USAF in Korea and Vietnam and by the RAF in a number of colonial campaigns with questionable efficacy. Air force tactical reconnaissance and fire support for land operations proved essential in

⁹⁰ Michael Howard, "The Concept of Air Power: A Historical Appraisal," *Air Power History*, Vol. 42, No. 4, Winter 1995. See also Richard Overly, "Doctrine not Dogma: Lessons from the Past," *Royal Air Force Air Power Review*, Vol. 3, No. 1, Spring 2000.

numerous conflicts, along with the increased use of transport aircraft for strategic and tactical movement and helicopters for battlefield mobility.

The reality of the application of air power presented itself in the small wars of the period, the British with their colonial campaigns and the United States with the air war in Korea, along with the Berlin airlift. In these small wars, air power reverted to the role of a supporting arm to land power operations. Despite the utility of air power for the successful conduct of these brushfire wars, political leaders and military strategists remained fixated on air power's importance as the final arbiter in the event of global thermonuclear war. This was reflected in the amount of funding allocated to air power, partly to build up large air forces, but also to meet the high cost of rapid technological developments.

This reliance on air power derived from a number of elements in the Western world's military belief system. Foremost was the conviction that air power could substitute for large armies in dealing with the Communist threat. There was an inherent belief in the superiority of technology. A further rationale for air power was the perception that it represented a relatively bloodless way to strike at the enemy. The lacunae in the emphasis on strategic air power were demonstrated in the numerous small wars of the post-war period. Anglo-American victory in the Second World War meant that air power occupied a prominent place in the determinants for that victory. When it came to re-establishing defence organizations in the post-war environment, the prominence of air power was recognized both by the Allied powers, the defeated Axis powers and by nations that had remained neutral during the war. This factor was to exert an influence on the re-organization of air forces from being ancillary arms to a nation's army and navy when originally formed during the inter-war period, to being re-established as independent air arms, a third service, equal in status to armies and navies. Separate naval aviation branches were also

established in recognition of the importance of naval aviation during the war. In addition, armies began to establish small air arms within their organizational structure.

Technology was also a driver for air power during this period. Every nation wanted to display its national technical prowess in the jet age with the development of a shiny jet fighter. However, most of these advanced aircraft projects undertaken by secondary and tertiary powers were doomed to failure. Even the US and the UK had to contend with the cancellation of costly aircraft projects. Closely linked with the complexity of new technology, were the increased costs associated with advanced aircraft projects both in their design, production and maintenance. These factors were to greatly influence the post-war development and expansion of the RCAF that will be explored in subsequent chapters.

Chapter 3

The Development of Canadian Air Power to 1950

Introduction

The aim of this chapter is to provide the background on the development of air power in Canada in the period up to 1950. An understanding of the early developments of Canadian air power is essential in appreciating the expansion of the RCAF during the Cold War period, 1948 to 1957. This chapter will provide a brief overview of the development of air power up to and including the Second World War, but the emphasis will be placed on the beginnings of RCAF expansion in the period 1948-1950. Areas to be covered include the inter-war development of the RCAF, renewed emphasis on the military aspects of the RCAF after 1935, initial planning for the RCAF contribution to the Second World War and the actual RCAF contribution to the war, and the initial post-war development of the RCAF and the Canadian aircraft industry.

Defence policy analyst Douglas Bland has posited the view that "...Canadian defence policy...is...whatever the prime minister of the day happens to think it is, or says it is."¹ Despite the desire in Canada from both politicians and the public alike for "...a well-organized, snappy defence force that will be a credit to Canada without being too expensive," during the inter-war period, the Canadian defence forces had a very low priority for spending until re-armament began after 1935.² This was particularly the case when it came to the matter of air power.

¹ Douglas Bland, "Everything Military Officers Need to Know About Defence Policy-Making in Canada," in D. Rudd, J. Hanson and J. Blitt (eds), *Advance or Retreat? Canadian Defence in the 21st Century*, Toronto: Canadian Institute of Strategic Studies, 2000, p. 15.

² George Graham, Minister of Militia and Defence/Minister of the Naval Service, April 1922, as quoted by Desmond Morton, *A Military History of Canada*, revised edition, Edmonton: Hurtig Publishers, 1990, p. 170.

For Canada's defence forces, the establishment of an aviation component was problematic from the earliest days.³ During the course of the First World War, there were seven separate "air forces" in which Canadians served – Canadian Aviation Corps (1914), Royal Flying Corps (1914-1918), Royal Naval Air Service (1914-1918), Royal Flying Corps Canada (1917-1918), Royal Air Force (1918), Canadian Air Force (1918-1919) and Royal Canadian Naval Air Service (1918).⁴ At the war's end, both the CAF and RCNAS were disbanded, but in February 1920, the Canadian government did authorize a "new" Canadian Air Force (CAF), a part-time air militia to provide refresher training for former wartime pilots. During the course of 1922-23, a Permanent Force of 307 personnel was approved, becoming the Royal Canadian Air Force (RCAF) on 1 April 1924.⁵ However, the RCAF was subordinate to the Militia, with the senior RCAF officer, appointed as the Director RCAF. It was not until 1938, on the eve of war, that the RCAF gained its autonomy as a separate service with the Chief of Air the Staff co-equal with his Militia and RCN counterparts.

During most of the inter-war period, the RCAF was not a fighting force, with the majority of its pilots described as "bush pilots in uniform." In its principal roles, one-half was

³ See the following articles on early attempts at Canadian military aviation by Wing Commander F.H. Hitchins, the RCAF Air Historian: "Too Expensive a Luxury" – Part I, *The Roundel*, Vol. 11, No. 6, July-August 1959, and "Too Expensive a Luxury" – Part II, *The Roundel*, Vol. 11, No. 7, September 1959, and "Canadian Aviation Corps," *The Roundel*, Vol. 11, No. 8, October 1959.

⁴ See S.F. Wise, *Canadian Airmen and the First World War*, *The Official History of the Royal Canadian Air Force – Volume I*, Toronto: University of Toronto Press, 1980, and 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, 1986.

⁵ For a view of the early post-First World War Air Force, see Randall Wakelam, "Forging the RCAF: Sword or Ploughshare?" *Canadian Defence Quarterly*, Vol. 25, No.1, September 1995, Wayne Ralph, *Barker VC*, Toronto: Doubleday Canada Limited, 1997, Chapter 12, "Barker and the Foundation of the RCAF." For the period 1924-1931, see Desmond Morton, "A Non-Operational Air Force: The RCAF 1924-1931," in W.A. March, ed., *Sic Itur Ad Astra: Canadian Aerospace Power Studies, Volume 3, Combat if Necessary, But Not Necessarily Combat*, Department of National Defence: Canadian Forces Aerospace Warfare Centre, Trenton, Ontario, 2011. For the development of the RCAF during the late 1920s and 1930s, see Norman Hilmer, "The RCAF in 1927," *High Flight*, Vol. 2, No. 3, May-June 1982, Carl A. Christie, "The Royal Canadian Air Force and the Road to War," in W.A. March, ed., *Sic Itur Ad Astra: Canadian Aerospace Power Studies, Volume 2, Big Sky, Little Air Force*, Department of National Defence: Canadian Forces Aerospace Warfare Centre, Trenton, Ontario, 2009. See also William J. McAndrew, "Canadian Defence Planning Between the Wars: The Royal Canadian Air Force Comes of Age," *Canadian Military History*, Vol. 22, No. 1, Winter 2013.

devoted to military flying training, while the remainder of the RCAF roles consisted of civil flying – aerial photography for mapping and survey, forest fire patrols and anti-smuggling patrols.⁶ During the Great Depression, the RCAF was severely hit with cutbacks with its budget being reduced from \$7.5 million in 1930-31 to \$1.75 million in 1932-33.⁷ This resulted in the release of seventy-eight officers, 100 airmen and 110 civilians – a significant number in such a small force of 1,100 personnel.⁸ The positive side of these reductions was a greater emphasis being placed on military training. Indeed, just prior to the onset of the Great Depression, the RCAF acquired its first combat aircraft since 1919 with nine Armstrong Whitworth *Siskin* fighters (1927) and six Armstrong Whitworth *Atlas* Army Co-operation Aircraft (1928-29).⁹ In addition, construction began of RCAF Station Trenton in 1931, this station becoming a key installation during both the Second World War and the Cold War. It was also during this period that the first Non-Permanent squadrons were established, providing a RCAF “footprint” into the civilian community across Canada.¹⁰

In 1936, with the beginning of re-armament, the government made the RCAF the top defence priority. In April 1939, a new expansion programme was announced to consist of 5,000 in the Permanent Force and 2,200 auxiliary air force personnel (as the Non-Permanent Force had been renamed in 1938) to be equipped with 527 aircraft organized into eleven Permanent Force

⁶ For the difficulties of procuring aircraft for such an air force, see William McAndrew, “The Early Days of Aircraft Acquisition in Canadian Military Aviation,” *Canadian Defence Quarterly*, Vol. 12, No. 2, Autumn 1982.

⁷ D.J. Goodspeed, (ed.) *The Armed Forces of Canada 1867-1967: A Century of Achievement*, Ottawa: Queen’s Printer, 1967, p. 106.

⁸ *Ibid.*

⁹ W.A.B. Douglas, *The Creation of a National Air Force, The Official History of the Royal Canadian Air Force – Volume II*, p. 122.

¹⁰ See Mathias Joost, *McNaughton’s Air Force: The Creation of the First Non-Permanent Active Air Force Squadrons, 1931-1933*, Kingston, Unpublished MA Thesis, Royal Military College of Canada, Kingston, Ontario, September 2008.

and twelve Auxiliary squadrons.¹¹ However, when war was declared in September 1939, the RCAF consisted of 3,100 Permanent Force and 1,100 Auxiliary personnel equipped with 270 aircraft of twenty-three different types of which 124 were operational aircraft including only thirty-nine aircraft that could be considered modern.¹²

Canadian Air Power and the Second World War

With the outbreak of the Second World War in 1939, the Canadian government was hoping to make its participation one of “limited liability.”¹³ Greatly sensitive to the enormous casualties suffered in the First World War, the government believed that its participation could focus on air power, including the provision of training in Canada, and the development of aircraft manufacturing. In the event, the demands of English Canadian cabinet ministers, reflecting public expectations that the country would contribute land forces as in the First World War, compelled the government to send a single army division. Hopes that Canada could limit its contribution to this token land force and a more substantial air force effort were dashed by the fall of France in 1940, and it now become a matter of total war. Canada built up a large Army contribution, First Canadian Army, along with much larger air and naval contributions than had ever been imagined.

¹¹ Goodspeed, p. 107.

¹² Ibid. See also Roger Sarty, “Mr. King and the Armed Forces,” in Norman Hillmer et al. (eds.), *A Country of Limitations: Canada and the World in 1939*, Canadian Committee for the History of the Second World War/Canada. Department of National Defence/Directorate of History, 1996. Sarty’s description of Mackenzie King’s involvement in the late pre-war period certainly reflects Bland’s comments on prime ministers and defence policy.

¹³ Sandy Babcock, “The British Commonwealth Air Training Plan and Limited Liability,” in W.A. March, ed., *Sic Itur Ad Astra: Canadian Aerospace Power Studies, Volume 2, Big Sky, Little Air Force*, Department of National Defence: Canadian Forces Aerospace Warfare Centre, Trenton, Ontario, 2009.

In the case of the RCAF, expansion comprised three components.¹⁴ First, there was the British Commonwealth Air Training Plan (BCATP). Second, there was the RCAF Overseas that ultimately peaked at forty-eight squadrons by 1945 including fifteen bomber, fourteen day-fighter, three fighter-reconnaissance, four night-fighter and intruder, six coastal, three transport, and three Air Observation Post (AOP) squadrons serving in every theatre of war. Third, there was the RCAF Home War Establishment (HWE) that peaked at thirty-seven squadrons operating fighter, bomber reconnaissance and transport squadrons principally in the Eastern (nineteen squadrons) and Western (eighteen squadrons) Air Commands. During the course of the war, the RCAF expanded into the fourth largest Allied Air Force operating as a “full menu” Tier one air force in which 232,632 men and 17,030 women (RCAF Women’s Division) served – all volunteers.¹⁵ There were 17,100 fatal casualties, including 10,000 who served with RAF Bomber Command. At its peak strength in January 1944, The RCAF establishment consisted of 215,000 personnel consisting of BCATP (100,000), HWE (65,000) and RCAF Overseas (46,000).

During the Second World War, the RCAF had a “good war,” with the success of the BCATP, the very large contribution of air forces to both home defence and the offensive against the Axis overseas. An additional aspect of the RCAF effort was its linkage with the tremendous growth of the Canadian aircraft industry, over 16,000 aircraft being produced during the course of the war. These factors were to provide the impetus for the development of a large post-war air

¹⁴ For the BCATP and HWE see Douglas, *The Creation of a National Air Force, The Official History of the Royal Canadian Air Force – Volume II*. For the RCAF Overseas, see Brereton Greenhous et al, *The Crucible of War 1939-1945, The Official History of the Royal Canadian Air Force – Volume III*, Toronto: University of Toronto Press, 1994.

¹⁵ “World’s Fourth Largest Air Force?” *Pathfinder: Air Power Development Centre Bulletin*, Issue 119, September 2009, Royal Australian Air Force. In reality, the RCAF became the fourth largest Allied air force when it peaked at 215,000 personnel in January 1944. By 31 May 1945, the RCAF stood at 164,846 personnel. In the case of the RAAF, the service peaked at 178,622 on 29 August 1945, but quickly demobilized to 13,238 members by October 1948 and further reduced to 7,897 by the end of 1948. At different periods, both the RCAF and the RAAF can claim this distinction.

force, particularly when the Cold War became “hot” with the outbreak of the Korean War in 1950.

The nascent airmindedness that had taken hold in Canada during the 1920s had exploded during the course of the war. Jonathan Vance noted “when the RCAF ballooned from a few thousand members in 1939 to a quarter of a million six years later, it fundamentally changed the relationship between aviation and the general population.”¹⁶ It was not only those quarter of a million Canadians in RCAF uniform that were affected, but to those numbers must be added the 122,000 employed in the aircraft industry, 50,000 Royal Canadian Air Cadets, and the tens of thousands of civilians who were employed at RCAF and BCATP bases across the country and the 30,000 members of the Aircraft Detection Corps – these people all had families and friends. The media also played a crucial role in promoting this airmindedness.¹⁷

Planning for Post-War Air Power

The very important part played by air power in the Canadian effort in the Second World War did much to stimulate continued airmindedness after 1945. Planning for the post-war RCAF had begun while the Second World War was still in progress with the completion of the “Brief on Post-War Planning for the Royal Canadian Air Force” by Air Commodore K. M. Guthrie, the Deputy Air Member Air Staff (Plans) in December 1943.¹⁸ This document outlined the four principles that were to be used as a guide for future planning. First, the RCAF should be capable of both defensive and offensive operations. Second, the RCAF should be organized to enable its rapid transition from peacetime to wartime footing. Third, the RCAF should include

¹⁶ Jonathan Vance, *High Flight: Aviation and the Canadian Imagination*, Toronto: Penguin Books, 2002, p. 262. See also Air Marshal William A. Bishop, *Winged Peace*, Toronto: The Macmillan Company of Canada Limited, 1944.

¹⁷ Vance, pp. 262-281.

¹⁸ James Eayrs, *In Defence of Canada – Volume 3: Peacemaking and Deterrence*, Toronto: University of Toronto Press, 1972, p. 79.

an air and ground training system capable of rapid expansion. Fourth, the RCAF had to be highly mobile, capable of deploying and fighting in either North America or overseas.¹⁹

The Air Force planners eventually developed a plan for a post-war Regular RCAF that was to consist of sixteen squadrons comprising four day fighter, two medium bomber, four heavy bomber, two general reconnaissance, two long-range transport, one troop transport and one photographic survey squadrons.²⁰ The RCAF would require 30,000 personnel to operate these squadrons and to train the Auxiliary and Reserve Force. The estimated annual budget to support this force was \$78 million.²¹ (This proposed force structure should be compared with the pre-war RCAF with its 4,000 personnel and \$10 million budget in 1938-39.) In the event, government restraints on spending considerably reduced the organization recommended by the planners.²²

On 28 February 1946, Colin Gibson, the Minister of National Defence (Air), made a speech to the Empire Club in Toronto entitled “Air Power in Canada” that outlined the government’s policy.²³ With a strength of 16,100 personnel, the Permanent Force was to consist of eight squadrons – two bomber reconnaissance, two transport, one fighter reconnaissance, one fighter-bomber, one air observation post (AOP) and one photographic squadrons – and eight composite flights to include communications, air-sea rescue, glider and target towing. The AOP

¹⁹ Ibid. p. 80.

²⁰ In addition to the sixteen Regular RCAF squadrons, there would have been twenty-eight Auxiliary squadrons consisting of nine fighter, nine medium bomber, eight fighter-bomber and two photo-reconnaissance squadrons, Babcock, p. 44.

²¹ Eayrs, *In Defence of Canada – Volume 3*, p. 80.

²² RCAF planners continued to argue for Regular personnel strength of 20,000 with ten squadrons along with an Auxiliary Force of 10,000 with nineteen squadrons. The Cabinet was presented with three options, Schemes A to C, ranging from most to least expensive at an annual cost of \$69 million, \$59 million and \$50 million respectively. Gibson recommended the adoption of Scheme B to the Cabinet as it represented the establishment of nineteen combat squadrons, including four Regular squadrons compared to twenty-four squadrons (including five Regular squadrons) in Scheme A and seventeen squadrons (but only two Regular squadrons) in Scheme C, Babcock, pp. 73-76.

²³ Colin Gibson, *Air Power in Canada*, An Address to the Empire Club of Toronto, 28 February 1946.

and glider units would consist of both RCAF and Army personnel.²⁴ The Auxiliary Air Force would consist 4,500 personnel manning ten fighter, three fighter-bomber and two fighter-reconnaissance squadrons.²⁵ Gibson explained: “the Auxiliaries are intended to provide a force fully organized, manned and equipped which... can be mobilized for operations in conjunction with the Army, in the same way that RCAF wings formed part of the 2nd Tactical Air Force during the war in Europe.”²⁶ Gibson also mentioned a RCAF Reserve of 10,000 officers and men, the continuation of the Air Cadets created during the war, and the retention of the RCAF Staff College that would work closely with the other services and the RAF and USAAF.²⁷ One-third of the eleven-page speech was devoted to research, including the Test and Development Establishment at Rockcliffe, the Winter Experimental Establishment at Edmonton and the Institute of Aviation Medicine in Toronto. Gibson noted that the RCAF was to be equipped with Canadian designed and manufactured jet fighters (including their engines).²⁸ This post-war RCAF was to require an annual budget of \$59 million when fully implemented.²⁹ Gibson was proposing the creation of a balanced air force designed for offensive and defensive operations, embodying the same concepts as the more ambitious plans previously put forward by the air staff.³⁰

The Early Post-War RCAF 1946-47

The RCAF ended the war with a personnel strength of 164,846 on 31 May 1945. Much of this force was demobilized over the next year, but there were also a number of overseas

²⁴ Ibid. p. 6. Scheme B was finalized by April 1946 as the “Post War Plan for the Royal Canadian Air Force,” and referred to as Plan B. Subsequent RCAF Plans into the 1950s up to Plan H followed this alphabetical sequencing.

²⁵ Ibid. pp. 6-7.

²⁶ Ibid. p. 7.

²⁷ Ibid. p. 7.

²⁸ Ibid. p. 10.

²⁹ Ibid. p. 8.

³⁰ Bomber squadrons had been deleted from the original proposals, but a large number of fighter and fighter-bomber squadrons intended for tactical support to the Army were retained.

commitments that required RCAF units. Four fighter squadrons were deployed in Germany as part of the British Air Forces of Occupation (BAFO), the three squadrons of No. 120 (Transport) Wing had also deployed to the Continent in support of the Canadian Army Occupation Force (CAOF), two bomber squadrons were deployed in Great Britain on transport tasks, an AOP squadron was included in the CAOF, and a Canada-based transport squadron provided overseas support. However, with the withdrawal of the CAOF in 1946, these RCAF units were disbanded, leaving no combat squadrons in the Regular Force.³¹ The Regular RCAF roles were limited to air transport, search and rescue, and air photography and mapping with five flying squadrons.³² Seven Auxiliary squadrons were formed in 1946 consisting of No. 400 Squadron (Toronto), No. 401 Squadron (Montreal), No. 402 Squadron (Winnipeg), No. 418 Squadron (Edmonton), No. 424 Squadron (Hamilton), No. 438 Squadron (Montreal) and No. 442 Squadron (Vancouver).³³ Apart from an Auxiliary fighter squadron establishment of 265 personnel for each unit, there was also a need for RCAF Regular Force support detachments varying in size from fifty to 100 personnel depending whether or not the Auxiliary squadron was co-located on an existing RCAF station.³⁴

In December 1946, Brooke Claxton was appointed as the MND, a post that he was to occupy until 1954 during the period that included most of the RCAF post-war build up.³⁵ Though he had a long-time interest in foreign policy and international affairs, until this appointment,

³¹ In 1946, the Permanent Force became the Regular Force.

³² The importance of the post-war aerial photography/survey program is detailed in Arthur Pearcy, Jr. *The Dakota: A History of the Douglas Dakota in RAF and RCAF Service*, London: Ian Allan Ltd, 1972. During the spring and summer months, this involved a considerable number of aircrew operating *Lancaster*, *Mitchell* and *Dakota*, *Canso* and *Norseman* aircraft supported by several hundred Air Force technicians. This effort was focused around No. 22 (Photographic) Wing with three squadrons operating from 1947 until 1950.

³³ Samuel Kostenuk and John Griffin. *RCAF Squadron Histories and Aircraft 1924-1968*, National Museum of Man/National Museums of Canada, Toronto: Samuel Stevens Hakkert & Company, 1977.

³⁴ Arthur Macdonald, "The RCAF Today," *Canadian Aviation*, Vol. 19, No. 10, October 1946.

³⁵ David Jay Bercuson, *True Patriot: the Life of Brooke Claxton, 1898-1960*, Toronto: University of Toronto Press, 1994.

Claxton had not previously been involved in defence issues.³⁶ Claxton had served with the Canadian Expeditionary Force (CEF) overseas in the First World War so he was sympathetic to the notion of emphasizing air power in order to avoid land force commitments that could be so politically divisive and so costly in terms of human life. Though the RCAF was to be the major beneficiary of defence resources during his tenure, Claxton was no simple proponent of what Bland has referred to as the “strong service” concept that promoted the view that a “strong army, navy and air force in and of themselves will provide for a strong national defence.”³⁷ Indeed, Claxton had originally been appointed as the MND by Mackenzie King with the primary remit to “consolidate, reduce and rationalize” DND and the three services through the elimination of duplicate activities that had emerged during the Second World War with three Defence Ministers and large autonomous military services.³⁸ Claxton was more concerned with re-establishing a defence establishment grounded on sound governance and an effective civil-military relationship rather than simply creating large military services.³⁹

A second aspect of Claxton’s responsibilities was to bring clarity and coherence to the Canadian-US bilateral defence relationship, while also controlling costs of any commitments.⁴⁰ In this capacity, even prior to his appointment as MND, Claxton was presented with the issues that were to confront his Department at the special Cabinet meeting on defence on 14-15 November 1946. In the Chiefs of Staff briefings to the Cabinet, Air Marshal Robert Leckie, the CAS, pointed out that that the Military Cooperation Committee, a sub-committee of the Permanent Joint Board on Defence (PJBD) had plans for the build up of a massive air defence

³⁶ During the inter-war period, Claxton had been involved with the League of Nations Society and the Canadian Institute of International Affairs.

³⁷ Bland, “Everything Military Officers Need to Know About Defence Policy-Making in Canada,” p. 23.

³⁸ Bercuson, p. 163.

³⁹ Douglas L. Bland, *Chiefs of Defence: Government and the Unified Command of the Canadian Armed Forces*, Toronto: Brown Book Company Limited, 1995, pp. 43-48.

⁴⁰ Bercuson, pp. 154-157.

system, a plan to which Leckie was opposed.⁴¹ Leckie believed that the US military based this proposed build up on the idea that the next war would begin with an attack on North America whilst the Canadian view was that such an attack would only be a diversion. At Claxton's suggestion a high level bi-lateral meeting was held on 16-17 December to clarify the issues where the Canadian delegation learned that the US official view was that “ ‘the threat to the physical security of North America... would be slight’ for at least the next five or six years.”⁴² With this perspective, it provided the Canadian government with the case not to proceed with a heavy investment in air defence at this time.

With the uncertainty of the international situation, the absence of an immediate threat and the need for Canadian fiscal soundness, the government at this time was not in any haste to develop large-scale armed forces as envisaged by the military planners. After only two months into his appointment as MND, and having been briefed by the Chiefs of Staff, on 17 February 1947 Claxton set down in a memorandum his concept of Canadian defence that reflected government policy strictly to limit defence expenditures. These remarks were used as the basis for his later statement in the House of Commons.⁴³ According to Bercuson, in the absence of well-developed intelligence sources, Claxton relied on “guesswork” to arrive at his forecast based on budgetary reality.⁴⁴ Claxton spoke of the three roles for the armed forces: defence of Canada, aid to the civil power, and a contribution to collective defence with friendly nations or under the auspices of the United Nations. He believed that there were only two potential theatres in which Canadian forces might be required to fight – however, there would be no requirement to fight in the primary theatre of Western Europe in the next five years, whilst any attack on the

⁴¹ See DHH 73/1223, Series 3, File 1301, Chiefs of Staff Committee Minutes of the 373rd Meeting 9 December 1946.

⁴² Ibid. p. 157.

⁴³ James Eayrs, *In Defence of Canada – Volume 3*, p. 91.

⁴⁴ Bercuson, p. 165.

North American theatre would be of secondary nature.⁴⁵ In fulfilling these roles, factors such as the impact of technology, the employment of the reserve forces, and budget restraint had to be taken into consideration. In the case of the air force, it would assist in the defence of Western Europe and North America, including "...if bombing is still in vogue co-operate in bombing the enemy."⁴⁶ In Claxton's view, a future war would evoke a similar response on the part of Canada as the previous two world wars – mobilization would take place after the outbreak of war, and it would not make sense to create this mobilization force in peacetime.⁴⁷ Claxton was prudent enough to argue on behalf of his Department around the Cabinet table during the budget discussions for the 1947-48 Fiscal Year that severely threatened DND.⁴⁸ Subsequent events would change Claxton's mind regarding the need for the build up of "peacetime" forces-in-being, including the development of the Big Air Force.

In Claxton's position as MND, like-minded individuals surrounded him. Crucially important in view of Bland's assertion that "defence policy is what the Prime Minister says it is," Claxton enjoyed the full confidence of both Mackenzie King and Louis St. Laurent. There was an evolution in King's views regarding the international situation during the final year of his tenure as Prime Minister. Following the end of the war in 1945, he had adopted his traditional determination to keep defence forces at a minimum. After receiving a "doom and gloom" British briefing in November 1947, "King was strongly influenced if not entirely convinced," that war

⁴⁵ Eayrs, pp. 91-92. See DHH 73/1223, File 1323 Cabinet Defence Committee 44th Meeting 2 June 1948. Commenting on the progress of defence planning, Claxton "observed that there seemed little possibility in the near future of an attack on this Continent except as a diversionary "one-way" attack."

⁴⁶ Ibid. p. 91.

⁴⁷ Ibid.

⁴⁸ Bercuson, p. 169. Bercuson notes "the battle over the defence budget left Claxton tired, depressed, and exceedingly unhappy with his role at DND....[however]...The budget-slashing of January-February 1947 was not repeated."

with the USSR might be imminent.⁴⁹ King was also deeply moved by the death of Jan Masaryk in the Czech *coup d'état* of March 1948.⁵⁰ Subsequent discussion between King and Lester Pearson (then the undersecretary of state for External Affairs) and the British High Commissioner broached the subject of a transatlantic arrangement between North America and the Western European Union for collective defence.

As King's second-in-command, Louis St. Laurent who attended the Dumbarton Oaks and San Francisco Conferences, was formally appointed as the Secretary of State for External Affairs in 1946, a job King had previously always done himself. St. Laurent was considered more internationally-minded than King and detailed his perspective on Canada's place in the world in the January 1947 Gray lecture. Discussing the various principles that were the cornerstone of Canadian policy, St. Laurent noted the importance of accepting international responsibilities.⁵¹ Upon becoming Prime Minister in November 1948, St. Laurent continued with this internationalist approach as witnessed by Canadian acceptance of the North Atlantic Treaty in 1949 followed up with sizeable Army and RCAF contributions to the Integrated Force in 1951, a considerable contribution to the United Nations forces upon the outbreak of the Korean War in 1950 and greatly expanded defence cooperation with the US for North American defence.

Lester Pearson was another official who greatly contributed to the changed circumstances of the post-war Canadian government. Appointed as the Undersecretary of State for External Affairs in 1946, Pearson represented a refreshing difference in External Affairs from the King

⁴⁹ Robert Bothwell, *Alliance and Illusion: Canada and the World, 1945-1984*, Vancouver: UBC Press, 2007, pp. 63-64.

⁵⁰ Ibid. p. 64.

⁵¹ Louis St. Laurent, Secretary of State for External Affairs, "The Foundations of Canadian Policy in World Affairs," *Duncan and John Gray Memorial Lecture*, University of Toronto, 13 January 1947. http://canadachannel.ca/HCO/index.php/Louis_St._Laurent_The_Foundations_of_Canadian_Policy_in_World_Affairs [Accessed 5 January 2015].

years of inactivity to an atmosphere where “Pearson and his career-diplomat colleagues... were determined to be present at the creation of the post-war international system.”⁵² Like Claxton, Pearson was a First World War veteran who had not only served in the Army, but also had some limited experience with the Royal Flying Corps.⁵³ As the Undersecretary of State, Pearson was very often in attendance at the Chiefs of Staff Committee meetings where he provided the External Affairs perspective on defence issues with obvious international impact. Pearson’s perspective regarding the USSR was seen as representing the dominant one in External Affairs by late 1946 noting that “without some fundamental change in the Soviet state system and in the policies and views of its leaders, the USSR is ultimately bound to come into open conflict with western democracy.”⁵⁴ In the fall of 1948, Pearson became a welcomed addition to the Cabinet with his transition from foreign service officer to politician becoming the Secretary of State for External Affairs where he continued his international activist approach over the next nine years.⁵⁵

At the service level, the RCAF was represented by Air Marshal Wilfred Curtis, a veteran of both the land and air forces from the First World War who assumed the appointment of the Chief of the Air Staff on 1 September 1947, a position he was to hold until January 1953 during

⁵² John English, *Shadow of Heaven: The Life of Lester Pearson, Volume 1: 1897-1948*, Toronto: Lester & Orpen Dennys Limited, 1989, p. 317. English notes Hume Wrong who replaced Pearson as the Canadian ambassador to Washington was more concerned with policy planning during his time at External Affairs in Ottawa, unlike the more pragmatic and activist Pearson.

⁵³ Ibid. pp. 29-47. Pearson served with the Canadian Army Medical Corps as an orderly in Salonika and then transferred to the RFC, until an accident terminated his flying career. Elsewhere in External Affairs, one finds evidence of the air-mindedness of the 1940s. Escott Reid’s paper on the post-war world mentions the influence of the “preachings of Seversky.” Denis Smith, *Diplomacy of Fear: Canada and the Cold War 1941-1948*, Toronto: University of Toronto Press, 1988, p. 23.

⁵⁴ Bercuson, p. 154.

⁵⁵ English, pp. 330-332.

the build-up of the Big Air Force.⁵⁶ In examining Curtis' role as CAS, it is useful to consider Claxton's views on the characteristics required for a successful Chief of Staff. These traits included a "silent soldier" (i.e. refraining from public commenting on government policy), recognition of the "national facts of life," including always taking the Canadian point of view and acknowledging the civilian control of defence policy: there had to be congruency between military plans and national objectives.⁵⁷ Potential Chiefs of Staff should have top-level NDHQ service to understand both military administration and civil-military relations, experience in high-level command, international service in London, Washington or NATO, and attendance at a senior defence college.⁵⁸

In all categories but one – he had not attended a staff or defence college – Curtis exceeded the desired criteria for his appointment. During the inter-war period, Curtis had worked in private business while remaining a "citizen soldier" in the Militia, and later "citizen airman" in the RCAF Auxiliary.⁵⁹ Promoted to the rank of Wing Commander and command of No. 101 (Auxiliary) Wing in December 1938, Curtis was instrumental in preparing No. 1 Manning Depot in Toronto to undertake the surge of recruits upon the outbreak of war in September 1939.⁶⁰ Curtis enjoyed a meteoric rise in the wartime RCAF being promoted to the rank of Air Vice Marshal and the Air Member for Air Staff (AMAS) by January 1944. As an Air Commodore, Curtis served overseas between November 1941 and January 1944 as the Deputy Air Officer Commanding for the RCAF Overseas. In this capacity, he demonstrated his outstanding administrative and staff skills and his strong advocacy of Canadianization of the

⁵⁶ Jeff Noakes, "Air Force Architect: Air Marshal Wilfred Austin Curtis, Chief of the Air Staff, 1947-1953," in Bernd Horn and Stephen Harris (eds.) *Warrior Chiefs: Perspectives on Senior Canadian Military Leaders*, Toronto: Dundurn Press, 2001.

⁵⁷ Bland, *Chiefs of Defence*, pp. 45-47.

⁵⁸ *Ibid.* pp. 47-48.

⁵⁹ Noakes, p. 239.

⁶⁰ *Ibid.* p. 240.

overseas RCAF, all the while conducting himself with tact and diplomacy. In his last wartime appointment as Air Member for Air Staff (AMAS), Curtis had been focussed on the planning for Canadian participation in Tiger Force (projected for the final offensives against Japan, but never deployed) along with being the senior Canadian officer on the PJBD and involvement on the Working Committee on Post-Hostilities Problems.⁶¹ After the war, Curtis served as the Air Member for Air Plans (AMAP) as well as the acting CAS during most of 1946.⁶² Certainly in the mind of his superior, Air Marshal Leckie, the retiring CAS, Curtis was an excellent choice to be his successor.⁶³

The Liberal government's airmindedness had the support of the Progressive Conservative defence critic, Georges Pearkes, a proponent of a strong air force.⁶⁴ Reginald Roy noted, "Despite his long association with the army, Pearkes considered the air force to be Canada's first line of defence. In 1949 he suggested that there should be three dollars spent on the air force for every dollar spent on the army."⁶⁵

Despite Gibson's reassuring words expressed in "Air Power in Canada," less than a year later, on 16 January 1947, fiscal restraints forced the Government to limit the forces to only seventy-five per cent of the approved 1946 establishment. For the RCAF, this meant a ceiling of 13,663 personnel rather than 16,100. Despite the fiscal constraints, there was a limited expansion of the Regular RCAF in 1947 with the establishment of No. 417 (Fighter-Reconnaissance) Squadron equipped with the North American *Mustang* and No. 444 (AOP) Squadron equipped with the *Auster Mk. VI*, both squadrons being located at the Canadian Joint

⁶¹ Ibid. pp. 242-243.

⁶² "Ottawa Report," *Canadian Aviation*, Vol. 20, No. 4, April 1947.

⁶³ Noakes, pp. 244-245.

⁶⁴ See Reginald H. Roy, *For Most Conspicuous Bravery: A Biography of Major-General George R. Pearkes, VC Through Two World Wars*, Vancouver: University of British Columbia, 1977, pp. 270-271.

⁶⁵ Ibid. p. 277. As the MND 1957-59, Pearkes remained a strong advocate for air power and the RCAF role.

Air Training Centre (CJATC), Rivers, Manitoba.⁶⁶ An additional Auxiliary squadron, No. 406 (Tactical Bomber) Squadron was established at Saskatoon, equipped with North American *B-25 Mitchell* twin piston-engine light bombers. These new squadrons, organized into the Mobile Tactical Wing, were intended to provide air support to the Canadian Army's Mobile Striking Force (MSF), an airborne and air transportable force of brigade group strength intended to repel a Soviet lodgement on Canadian territory.⁶⁷ Additional air support for the MSF was based on the *Dakota Mk. IV* transport that equipped RCAF transport squadrons.

Another RCAF role was the provision of air-sea rescue (ASR) flights in accordance with the RCAF being assigned the responsibility as the co-ordinating agency by the International Civil Aviation Organization (ICAO).⁶⁸ During the course of 1947, an ASR flight was established on the East and West coasts and at Edmonton equipped with Vickers *Canso* amphibian aircraft and Noorduy *Norseman* light transports. In personnel matters, although prospects were good for recruiting aircrew and technical officers, there was a continuing problem with the shortage of maintenance technicians amounting to almost 2,000 positions, a considerable number in a small air force.⁶⁹

⁶⁶ Although referred to as a "squadron," No. 417 Squadron normally only had an establishment of eight aircraft, so its disbandment in 1949 to become the Tactical Fighter Flight with six aircraft of the Air Operations School at Rivers had a negligible effect.

⁶⁷ Ottawa Correspondent, "Report on the RCAF," *Canadian Aviation*, Vol. 20, No. 10, October 1947. p. 84. See Bernd Horn, *Bastard Sons: An Examination of Canada's Airborne Experience 1942-1995*, St Catherines, Ontario: Vanwell Publishing Limited, 2001, in particular Chapters 2 and 3. See also Sean M. Maloney, "The Mobile Striking Force and Continental Defence," *Canadian Military History*, Vol. 2 No. 2, Autumn 1993 and David A. Charters, "Five Lost Years: The Mobile Striking Force, 1946-1951," *Canadian Defence Quarterly*, Vol. 7, No. 4, Spring 1978. See Raymond Stouffer, "Military Culture and the Mobile Striking Force," in P. Whitney Lackenbauer and W.A. March, eds., *Sic Atur Ad Astra, Canadian Aerospace Power Studies – Volume 4: De-icing Required! The Historical Dimension of the Canadian Air Force's Experience in the Arctic*, Department of National Defence: Canadian Forces Aerospace Warfare Centre, Trenton, Ontario, 2012.

⁶⁸ See "Search and Rescue," *Canadian Aviation*, Vol. 23, No. 4, April 1950.

⁶⁹ "The RCAF Today," and "Report on the RCAF."

The RCAF from 1948 and the Berlin Blockade

It was during 1948 that the reality of the tensions in the international system came to the forefront, and policy makers commenced the slow advance towards Canadian re-armament. The Communist Party *coup d'état* in February in Czechoslovakia was followed by the Soviet blockade of Berlin that began in June and was to last until the following May. Though the RCAF may have been short of combat air power in the spring of 1948, it certainly possessed an adequate number of transport aircraft and crews organized into three squadrons – No. 412 Squadron at Rockcliffe and No. 435 Squadron at Edmonton were equipped with the twin-engine *Dakota Mk. III* and *Mk. IV*, while No. 426 Squadron at Dorval was in the process of replacing its *Dakota* aircraft with the four-engine Canadair *North Star* transport.⁷⁰ The decision not to participate in the Berlin airlift was a political one, though Claxton raised a number of military uncertainties that would have emanated from the military staff. If one considers Canada's extensive post-war international engagement, then Leigh Sarty was correct in saying that "Canada's refusal to take part in the airlift therefore seems puzzling."⁷¹

The Canadian government's response to the Berlin blockade was particularly perplexing because the Canadian government, having come to appreciate the danger of another war in Europe, promoted the establishment of a trans-Atlantic collective defence organization. Both Maurice Pope, head of the Canadian Military Mission in Berlin, and the High Commissioner to the United Kingdom, Norman Robertson, had been informally approached about the possibility of Canadian assistance in the airlift.⁷² When the issue of Canadian participation was raised at the

⁷⁰ Kostenuk and Griffin, pp. 167, 185 and 191.

⁷¹ Leigh E. Sarty, "The Limits of Internationalism: Canada and the Soviet Blockade of Berlin, 1948-1949, in J.L. Black and Norman Hillmer (eds.) *Nearly Neighbours – Canada and the Soviet Union: from Cold War to Détente and Beyond*, Kingston: Ronald P. Frye & Company, 1988, p. 56.

⁷² *Ibid.* p. 59.

30 June Cabinet meeting, the previous waffling on the part of Prime Minister Mackenzie King disappeared when it was reported in the British press that Canada had been asked to help with the blockade, this earning the ire of King who felt that this was a replay of the 1922 Chanak Crisis.⁷³ However, Sarty correctly explained that the differences in the geo-strategic circumstances between the two events were quite obvious.⁷⁴ Claxton commented on the “great complexity” of the airlift operation, noting that a RCAF contribution of five or six *North Star* aircraft would be “a very small fraction of the aircraft needed.”⁷⁵ However, Claxton’s major focus was the fear that an RCAF aircraft might be involved in an “incident.”⁷⁶ Claxton further supported his argument against participation on the grounds that Canada had not been involved in determining policy in Germany.⁷⁷ St. Laurent, the Secretary of State for External Affairs supported Canadian participation, noting the need for firm and joint action, and that if war resulted, “Canada would necessarily be involved,” a point with which King and the Cabinet agreed.⁷⁸ But as a result of this very narrow legalistic and diplomatic interpretation, King could state in the House of Commons on 30 June that “no request ... for food stocks or for air transport” had been received from the British authorities, this approach remaining the official Canadian position throughout the airlift.⁷⁹

The timidity of the Canadian position became even more evident with the contribution of ten RAAF *Dakota* aircraft complete with crews and the South African Air Force contribution of fifty pilots for RAF service. In an editorial entitled “The Shame of Silence,” *The Globe and Mail* commented, “there is a time and place for diplomatic protocol. Friends do not stand on

⁷³ Ibid. p. 61.

⁷⁴ Ibid. p. 61.

⁷⁵ Ibid. p. 61.

⁷⁶ Ibid. p. 61.

⁷⁷ Ibid. p. 61.

⁷⁸ Ibid. p. 62.

⁷⁹ Ibid. p. 63.

ceremony in an emergency and the Berlin blockade has been very much an emergency.”⁸⁰ Later at the Cabinet meeting on 25 September, Claxton advised that a squadron of ten *Dakota* aircraft with ninety aircrew and 219 ground crew was immediately available, but the Cabinet still declined to make a Canadian contribution.⁸¹ According to Sarty, in the matter of Canadian civil-military relations, “the defence policy machinery was designed to take many considerations into account, and if the other factors outweighed the need to take military action then those factors would prevail.”⁸² The lack of participation by the RCAF in the Berlin airlift demonstrated that the existence of a military capability did not necessarily ensure its use. Canadian non-involvement in the Berlin airlift provides another example to support Bland’s thesis regarding Prime Ministers and defence policy-making.

The earlier limitations on the RCAF establishment were short-lived with the 28 December 1948 announcement that changing circumstances necessitated an expanded defence programme for 1949, including numerous improvements for the RCAF.⁸³ This change heralded an increased Canadian willingness to assume international responsibilities by St. Laurent on his succession to Mackenzie King as Prime Minister on the latter’s retirement in November 1948. If there had been some uncertainty towards the future international situation in 1947, moreover, it now became quite evident that the Soviet Union had become the dominant threat to peace in Europe. The Czech *coup d’état* in February 1948 and the Berlin blockade that commenced in June were manifestations of Soviet aggressiveness. Apart from the maintenance of armed forces of 2.8 million personnel (including 2.444 million in the Soviet Army), there had been the

⁸⁰ *The Globe and Mail*, 3 September 1948, p. 6.

⁸¹ James Eayrs, *In Defence of Canada, Volume 4: Growing Up Allied*, Toronto: University of Toronto Press, 1980, p. 48.

⁸² Brian K. Wentzell, *The Rise and Fall of Civil-Military Relations in Canada, 1946-1960*, Unpublished MA Thesis, Royal Military College of Canada, Kingston, Ontario, March 2006, p. 57.

⁸³ Canada. Royal Canadian Air Force Historical Section, *Silver Jubilee of the Royal Canadian Air Force 1924-1949*, Ottawa, 1949, p. 92.

Tushino air display on 3 August 1947 that revealed the existence of the *Tu-4 Bull* long-range bomber (reverse-engineered Boeing *B-29*) that could clearly attack targets in Western Europe and Alaska. It was also known that the Soviet Union was endeavouring to develop a nuclear bomb, though the detonation of such a device in August 1949 was unexpected and subsequently added to more immediate Western war fears.

The new defence programme resulted in a fundamental shift in RCAF planning away from the originally envisaged balanced air force that could conduct a myriad of air power functions to one that emphasized a focus on air defence. This programme included the procurement of new jet fighters, including the North American *F-86 Sabre*, and acceleration of the development of the Canadian *CF-100*.⁸⁴ With the greater emphasis placed on air defence for both for the Regular and Auxiliary components, there was a need for an effective command and control resulting in the establishment of a new formation headquarters, No. 1 Air Defence Group at Air Force Headquarters (AFHQ) Ottawa on 1 December 1948, which moved to St Hubert on 1 November 1949.⁸⁵

The establishment of the Air Defence Group provided some limited command and control of air defence in Eastern Canada, though the RCAF was certainly in no position to re-fight the Battle of Britain. This emphasis justified the role of eight Auxiliary squadrons, four of which were to be partially equipped with the *Vampire*, but also included the expansion of the Regular component from two to nine fighter squadrons. The expansion plan increased the Auxiliary force from ten to thirteen flying squadrons, and authorized the formation of seventeen

⁸⁴ DHH 73/1223 File 1223 Cabinet Defence Committee, 43rd Meeting, 15 April 1948, "A.V. Roe Canada Limited: Acceleration of Development."

⁸⁵ For details on the stand up of the Air Defence Group, see Don Nicks et al, *A History of the Air Defence of Canada 1948-1997*, Ottawa: Gilmore Publishing, 1997. As part of the greater emphasis on air defence, the Canadian Army established Headquarters Anti-Aircraft Command in February 1950 as an integral component of the RCAF Air Defence Group at St Hubert. See G.W.L. Nicholson, *The Gunners of Canada: The History of the Royal Regiment of Canadian Artillery – Volume II 1919-1967*, Toronto: McClelland and Stewart Limited, 1972, p. 548.

Aircraft Control and Warning Squadrons by 1951 along with the intent to increase the Auxiliary force to a strength of 25,000 personnel by 1954.⁸⁶ The defence programme reinforced the transition of the command and control structure of the post-war RCAF from a geographic to a functional organizational concept.

RCAF Organizational Changes

In 1938, the RCAF established its command system based on a geographical command structure, Eastern Air Command, Western Air Command, Central Air Command and the North-West Air Command, with the exception of Training Command. This type of organizational structure was to endure throughout the Second World War for the RCAF Home War Establishment. After the war, there was a gradual transition away from the geographical command structure towards one based on a functional approach.⁸⁷ The Eastern and Western Air Commands were disbanded on 1 March 1947 whilst Central Air Command (HQ Trenton, Ontario) and North-West Air Command (HQ Edmonton) continued to operate.

To the outsider, air force organization may have appeared confusing with the various types of nomenclature used for in the building blocks of the air force structure; in some cases, it was downright contradictory. For the most part, RCAF organization followed the RAF pattern, though there were some anomalies. The smallest building block was the squadron commanded by a squadron leader or wing commander. A squadron could be either a flying unit or a ground unit such as an Aircraft Control and Warning squadron. The number of aircraft in a flying

⁸⁶ Sandy Babcock, "Withered on the Vine: The Postwar RCAF Auxiliary," in *Canadian Military History Since the 17th Century*, 5-9 May 2000, Ottawa: Department of National Defence (A-JS-007-DHH/AF-001), 2000, p. 396.

⁸⁷ See J.H. Roberts, "The R.C.A.F.'s Functional Command Organization," *The Roundel*, Vol. 4, No. 10, November 1952, and A.R. Durston, "Organization of the R.C.A.F.," *The Roundel*, Vol. 5, No. 9, October 1953. See also Samuel Kostenuk and John Griffin, *RCAF Squadron Histories and Aircraft 1924-1968*, National Museum of Man/National Museums of Canada, Toronto: Samuel Stevens Hakkert & Company, 1977, pp. 144-147.

squadron varied on the type of aircraft that equipped that squadron, but normally a *Sabre* fighter squadron had a Unit Establishment (UE) of twenty-five aircraft whilst a *CF-100* fighter squadron consisted of eighteen aircraft. A transport or maritime reconnaissance squadron that involved a large number of aircrew usually consisted of twelve aircraft. Two or three flying squadrons were then organized into a wing normally commanded by a Group Captain as was the case in No. 1 Air Division in Europe. In Canada, a Group Captain normally commanded a RCAF station; a station could include one or more flying squadrons.

During the Second World War, RCAF overseas squadrons were usually organized as part of RAF functional commands. RCAF fighter squadrons serving with the RAF had been organized into wings that had been part of a group that in turn was part of the 2nd Tactical Air Force or Fighter Command, the next higher organizational building blocks. In the case of bomber squadrons, these were organized into bases that formed into a group that had Bomber Command as the next higher organization.

After the war, a hybrid organizational structure was initially adopted that consisted of commands and groups, the former being the legacy of the wartime structure whilst the groups were transitional towards the functional organizational concept. As the RCAF slowly expanded starting in the late 1940s, the groups were replaced by commands that included a large number of subordinate stations and units within each command. Whereas Group Captains had commanded the post-war groups; air officers in the rank of Air Commodore or Air Vice Marshal commanded the commands. The exception to this organizational construct was the Air Division that was formed for the command and control of Canadian fighter wings assigned to the Integrated Force in NATO. No. 1 Air Division was commanded by an Air Vice Marshal and was equal in status with the Canadian-based commands. No. 5 Air Division was a subordinate formation within Air

Defence Command commanded by an Air Commodore. No. 14 Group was formed within Training Command under the command of an Air Commodore to exercise command and control for the units and stations responsible for the conduct of NATO training.

This functional approach was more in keeping with the assigned defence tasks of the RCAF. The first functional command to be established was Maintenance Command in 1945 tasked with the responsibility for the disposal of thousands of aircraft. Maintenance Command was re-named Air Materiel Command on 1 April 1949 to better reflect its post-war responsibilities in providing logistics support to the remainder the RCAF.

In the initial post-war organization of the RCAF, groups subordinate to the existing geographical commands had been established to reflect the actual RCAF operational structure. No. 9 Group (HQ Rockcliffe), an independent formation, was responsible for air transport operations, whilst No. 10 Group (HQ Halifax) for maritime air operations was subordinate to Central Air Command, and No. 11 Group (HQ Winnipeg) responsible for Army tactical support operations and No. 12 Group (HQ Comox) responsible for Pacific coast air defence were subordinate to the North-West Air Command. With the disbandment of the geographical commands, these Groups were first raised to independent status and eventually to Command status. The first of the new operational Commands was the transition of No. 9 Group to Air Transport Command on 1 April 1948. No. 1 Air Defence Group was re-named Air Defence Command 1 June 1951 to reflect the priority and importance of its status within the RCAF. Training Command was established on 1 April 1949 replacing the Central Air Command. To administer the NATO programme on the Prairies, No. 14 Training Group was established as a subordinate formation on 1 August 1951. No. 10 Group was re-named Maritime Group on 1 April 1949 and became Maritime Air Command on 1 June 1953. No. 11 Group was re-named

Tactical Group on 1 April 1949, re-named once again as the Tactical Air Group on 1 August 1951 merging with the North-West Air Command, finally being re-named as Tactical Air Command on 1 June 1953. No. 12 Group was re-named No. 12 Air Defence Group within Air Defence Command on 1 July 1951, becoming No. 5 Air Division on 1 September 1955.

Table 3-1 – Transition of RCAF Command Structure 1946 and 1950			
1946		1950	
Central Air Command (HQ Trenton)	No. 10 Group (Halifax)	Training Command (HQ Trenton)	Maritime Group (HQ Halifax)
North-West Air Command (HQ Edmonton)	No. 11 Group (Winnipeg) No. 12 Group (Vancouver)	North-West Air Command No. 12 Group	Tactical Group (HQ Winnipeg)
Maintenance Command (HQ Rockcliffe)		Air Materiel Command (HQ Rockcliffe)	
No. 9 (Transport) Group (HQ Rockcliffe)		Air Transport Command (HQ Rockcliffe)	
		No.1 Air Defence Group (HQ St Hubert)	

In the case of air defence, it took some years to bring increased capabilities to the new organization. When authorized in 1946, the six original Auxiliary squadrons had been equipped with the *Harvard* advanced trainer aircraft. It was only in the Spring 1948 that five of these squadrons were equipped with the *Vampire* jet fighters – No. 400 Squadron Toronto, No. 401 Squadron Montreal, No. 402 Squadron Winnipeg, No. 438 Squadron Montreal and No. 442 Squadron Vancouver.⁸⁸ However, only No. 438 Squadron was allocated to the Air Defence Group, the other fighter squadrons were part of Training Command or the North-West Air Command. Two additional Auxiliary fighter squadrons were established in 1948, No. 403 Squadron in Calgary and No. 420 Squadron in London, equipped with the *Harvard*.⁸⁹ In September 1948, No. 1 (Fighter) Operational Training Unit at St Hubert was formed to train pilots on the *Vampire* in the air defence role of metropolitan areas. Subsequently, the first Regular Force *Vampire* fighter squadron, No. 410 Squadron, was formed at St Hubert on 1 December 1948 as part of No. 1 Air Defence Group. In fact, this was the only Regular Force fighter squadron as No. 417 Squadron at Rivers, Manitoba, equipped with the *Mustang* fighter-bomber, was disbanded on 1 August 1948.⁹⁰ The build up of the Air Defence Group proceeded at a slow pace as the second Regular Force *Vampire* squadron, No. 421 Squadron, was only established at RCAF Station Chatham, New Brunswick in September 1949.⁹¹

⁸⁸ The sixth Auxiliary squadron authorized in 1946, No. 424 Squadron, remained equipped only with the *Harvard* until November 1950, when it was equipped with the *Mustang*.

⁸⁹ 403 Squadron was equipped with the *Mustang* in November 1950 and 420 Squadron was equipped with the *Mustang* in December 1950.

⁹⁰ The *Mustang* aircraft continued to serve with the Tactical Fighter Flight used for training at the CJATC.

⁹¹ The Regular Force *Vampires* and the Auxiliary Air Force *Vampires* and *Mustangs* were not the only available fighter aircraft in Canada. The RCN Naval Aviation component included two squadrons on the East Coast, one of which could be deployed on the carrier, HMCS *Magnificent*, equipped with the formidable Hawker *Sea Fury* fighter. The missing element, however, was an integrated air defence system of command and control, radar for detection and fighters for interception.

When originally authorized in 1946, the roles of the original seven Auxiliary squadrons were intended to reflect what had been announced by Gibson in his February 1946 Empire Club speech; that is, RCAF squadrons that could support the Canadian Army in the field. Consequently, of the seven squadrons, four were fighter-bomber, one was light-bomber and only two were designated as fighter squadrons. However, a year later, six of the squadrons were re-designated as fighter squadrons and one light-bomber squadron, with no fighter-bomber squadrons.

The paucity of air defence aircraft had been noted at the Chiefs of Staff Committee meeting in December 1946 when discussing the Canadian-United States Joint Appreciation and Basic Security Plan.⁹² The CAS, Air Marshal Leckie, noted that though a fighter wing was not a “top priority” for FY 1947-48, he also observed “it was important...to give the government some of idea of increases which would later be required in the strength of the Air Force to meet the air menace.”⁹³ Leckie visualized the numbers required as likely in the neighbourhood of 25,000 and wished the government to know this.⁹⁴ This increase represented a fifty per cent increase in actual RCAF personnel strength. Prior to raising a fighter wing, the more immediate measures to be undertaken in order to establish an air defence system included the survey and selection of sites for radar stations, airfields and anti-aircraft weaponry.⁹⁵ Although there was no immediate air threat to Canadian territory, the existence of the Tupolev *Tu-4 Bull* long-range bomber added to concerns about the near future.⁹⁶

⁹² DHH 73/1223, Series 3, File 1301.

⁹³ Ibid.

⁹⁴ Ibid. p. 1.

⁹⁵ Ibid. p. 1.

⁹⁶ The *Tu-4 Bull* had a range of 3,300 miles – it was unable to reach the heartland of North America, but could strike London, UK, and Alaska from bases in Siberia.

Post-war defence planning for the RCAF was initially not directed at a specific threat, but the RCAF did undertake various initiatives to promote its independence and general readiness. Of prime importance was the agreement between the Canadian Government and Avro Canada on 31 October 1945 that authorized the design and development of a “single-seater jet-type fighter airframe to meet the requirements of the Department of National Defence specifications of AIR 7-1, Issue 1.”⁹⁷ Subsequently, the RCAF determined that its requirements were for a twin-engine, two-seater all weather interceptor fighter for the defence of Canada.⁹⁸ In August 1946, Avro Canada submitted three proposals based on the revised requirements with the RCAF accepting the design in October that best met its requirements, but the detailed design work did not commence until May 1947.⁹⁹ The decision to undertake this project for a complete aircraft – airframe, engine, fire control system and weapons – was based on the Second World War experience whereby the Canadian Government was often at the mercy of the US or the UK when it came to equipping the RCAF. The specifications of AIR 7-1 called for an aircraft that did not exist in 1945 -- or even in 1950 -- in either country.¹⁰⁰ The main role intended for this interceptor was to defend against the *Tu-4 Bull*. To obtain the aircraft as soon as possible for the RCAF, the aircraft was of a conventional design; the *Orenda* engines under development were innovative and were the greatest risk to the project’s success. The prototype *XC-100* aircraft first flew on 19 January 1950, with the first aircraft being delivered to the RCAF on 13 October 1951. The decision to undertake the development of an indigenous jet combat aircraft was to have significant impact on the development of the RCAF and the Canadian aircraft industry during the

⁹⁷ K.M. Molson and H.A. Taylor, *Canadian Aircraft since 1909*, Stittsville, Ontario: Canada’s Wings Inc, 1982, p. 44. See also “Canadian Jet Planes for RCAF Ensure Modern Air Force,” *Canadian Aviation*, Vol. 19, No. 1, January 1946, p. 62.

⁹⁸ *Ibid.*

⁹⁹ *Ibid.*

¹⁰⁰ Larry Milberry, *The Avro CF-100*, Toronto: CANAV Books, 1981, p. 13.

1950s providing an impetus for the concept of the Big Air Force. However, this project was fraught with difficulties that will be discussed in later chapters.

A second decision taken by the RCAF in 1945 was to acquire a limited number of jet fighters to provide RCAF pilots with jet aircraft experience in an economical manner. The RCAF had conducted trials with both the *Meteor* and the *Vampire* in 1946, ultimately opting for the *Vampire* fighter.¹⁰¹ The RCAF bartered with the RAF for the largest number of jet fighters it could obtain in exchange for 200 late-model *Spitfire* fighters that were still considered more suitable by the RAF for overseas service.¹⁰² Ultimately, the decision turned on numbers – sixty-six *Meteors* or eighty-five *Vampires* in exchange for the *Spitfires*.¹⁰³ The *Vampire* did not have an ejection seat; possessed a marginal speed increase compared to piston engine fighters and had very short range that diminished its usefulness in the Canadian environment. It was also maintenance-intensive, a fault common to many of the first-generation jet fighters.¹⁰⁴ Despite its limitations, the *Vampire* did serve the purpose of providing the RCAF, particularly the Auxiliary squadrons across the country, with jet fighters, pending the acquisition of more modern aircraft.¹⁰⁵

The third decision that was to greatly impact the RCAF was that to acquire the North American *Sabre* fighter under licenced production in November 1948.¹⁰⁶ The *Sabre* represented

¹⁰¹ Hugh Halliday, “The Problem with Vampires,” *Legion Magazine*, March-April 2010.

¹⁰² *Ibid.*

¹⁰³ *Ibid.*

¹⁰⁴ Early jet engines, such as the de Havilland *Goblin* that powered the *Vampire* normally had a service life of 500 hours, of which some components had to be changed at the 200 hour point. See “Maintenance at a Minimum,” *Flight*, 7 April 1949. See also “de Havilland *Goblin* Overhaul,” *Canadian Aviation*, Vol. 23, No. 6, June 1950, pp. 16-19.

¹⁰⁵ *Ibid.* Many former piston engine fighter pilots had some difficulty making the transition to jet fighters, as there was not the same degree of instant responsiveness as experienced with piston engine fighters. This may explain why only thirty-six of the eighty-five aircraft were still in service in 1956 when the *Vampire* was withdrawn from service. See Ronald A. Keith (Editor), “Is the *Vampire* Obsolete?” *Canadian Aviation*, Vol. 21, No. 3, March 1949.

¹⁰⁶ See R.V. Dodds, Director of Public Relations, RCAF, “RCAF Aircraft Procurement Policy,” *The Roundel*, Vol. 2, No. 1, November 1949. Dodds seems exceedingly polite in explaining why a British aircraft was not selected –

the ultimate day jet fighter at the time and was considerably more expensive than the *Vampire*.¹⁰⁷ Indeed, the decision to acquire the *Sabre* resulted in some minor controversy on the part of the Official Opposition.¹⁰⁸ George Drew, the leader of the Progressive Conservative Party attempted to score political points by noting that 800 *Vampire* fighters could have been obtained for the cost that the government was willing to expend to obtain 100 *Sabre* fighters, notwithstanding the definitive increase in capability represented by the latter aircraft.¹⁰⁹

A common misperception was that the RCAF became “fighters first” in the early post-war period.¹¹⁰ In fact, the RCAF still adhered to the concept of a balanced air force, including bombers. It was acknowledged that in the event of war, the requirement for fighters for European (including British) defence would be essential at the outset.¹¹¹ However, two Auxiliary squadrons equipped with the *B-25 Mitchell* light bomber operated from 1946 to 1958 in support of the MSF. At one point, a tactical bomber version of the *CF-100* was under consideration as a *Mitchell* replacement. For planning purposes, the RCAF used various post-war bomber designs (i.e. Boeing *B-50*, Boeing *B-47*, English Electric *Canberra*, Vickers *Valiant* and the Avro *Vulcan*) as benchmarks for its ongoing desire for a long-range bombing capability.¹¹² Similarly, in NATO discussions on “Closing the Gap” in Allied strength in 1951, a second proposed RCAF

much of the argument centered around the difficulties experienced with aircraft procurement in the Second World War.

¹⁰⁷ See DHH 73/1223, File 1820, Minutes of 67th Meeting of the Air Members 14 February 1949, Item 464, “Fighter Aircraft Procurement Policy for the RCAF.”

¹⁰⁸ Blind criticism of Liberal defence policy often caused discomfort for Pearkes, the Official Opposition defence critic who was very much an airpower supporter. On the other hand, George Drew, leader of the Official Opposition had no such compunctions in trying to score political points.

¹⁰⁹ See Ronald A. Keith, “Is the Vampire Obsolete?” The development and production of the Canadair *North Star* was also criticized by Drew as “a ‘travesty’ on the laws of aerodynamics and aero design, a ‘haphazard’ combination of a British motor and an American-designed airframe.” See Ronald A. Keith (Editor), “Mr Drew off the Beam,” *Canadian Aviation*, Vol. 21, No. 5, May 1949.

¹¹⁰ See Bruce P. Barnes, *Fighters First: The Transition of the Royal Canadian Air Force, 1945-1952*, Unpublished MA Thesis, Royal Military College of Canada, November 2006.

¹¹¹ DHH 73/1223, Series 3, File 1304, Chiefs of Staff Committee, Minutes of the 432nd Meeting, 22 September 1948.

¹¹² DDH 73/1223 Series 3 Sub-series 13, Minutes of 81st Meeting of the Air Members, 22 June 1949 and DDH 73/1223 Series 3 Sub-series 13, Minutes of the 155th Meeting of the Air Members, 21 May 1952.

air division assigned to Europe was to consist of tactical jet bombers. This will be discussed in Chapter 4.

The RCAF was committed to providing some of its scarce resources during this period to support the Canadian Army's MSF. In its initial planning for the post-war period, the Canadian Army had envisaged the establishment of a large peacetime army based on its wartime experience. Similar to the other services, the Canadian Government did not accept this view and the Army's personnel strength was based on a 25,000 man organization, though fiscal restraints kept this number limited to 20,000. The Regular Force was assigned its traditional role of training the Reserve Army to expand to a force of six divisions in the event of its mobilization. However, for the first time in its history, the army was also given a peacetime role to provide an airborne/air transportable brigade group (23rd Canadian Infantry Brigade Group) to defend the country against the threat of small incursions by the Soviets, some that might include the attempt to establish airfields in remote northern areas of Canada and Alaska that would threaten southern parts of Canada and the United States.

Support to the MSF entailed a sizable commitment of RCAF aircraft strength during this period. First, there was the CJATC at Rivers, Manitoba, consisting of aviation elements from the three services. Out of an establishment personnel strength that was to grow to 800, over 500 of these positions were from the RCAF.¹¹³ The CJATC, a key unit within No. 11 Group (eventually Tactical Air Command), with a focus on Land-Air Warfare was one of the first joint organizations in the Canadian armed forces.¹¹⁴ Though it was to be comprised of a relatively

¹¹³ See Squadron Leader C.L. Heide, "Stations of the RCAF: CJATC Rivers," *The Roundel*, Vol. 13, No. 8, October 1961.

¹¹⁴ For example, see the Table of Contents for the *Tactical Air Support* manual that lists numerous précis on tactical air support, including naval aviation in support to ground forces. *Tactical Air Support*, Canadian Joint Air Training Centre, Ground Training Wing, Tactical Air Support School, Rivers Camp, Manitoba, 3rd Edition, November 1955

small portion of the RCAF, the CJATC performed key joint air activities with the other services highlighting the high degree of airmindedness present in the RCN and Canadian Army.¹¹⁵ The CJATC ultimately expanded to include the Airborne School, the Air Supply School, the Transport Air Support School and the Tactical Air Support School (the latter two units being key to the Land/Air Warfare component), the Light Aircraft School and the Helicopter School.¹¹⁶ RCAF flying units at the CJATC included the Tactical Fighter Flight (TFF) equipped with the *Mustang* piston-engine fighter and the Transport Support Flight (TSF) equipped with the *Dakota* transport.¹¹⁷ Some Second World War vintage *Hadrian* gliders remained in service until 1955. Commencing in 1948, the RCN annually deployed its fighter-bomber squadrons to Rivers to undertake close air support training in support of the Army both at Rivers and at Camp Shilo.¹¹⁸ During the first summer in 1948, these squadrons were equipped with *Seafire* piston-engine fighters and *Firefly* piston-engine fighter-reconnaissance aircraft. Subsequently, until 1956, the RCN aircraft consisted of *Sea Fury* piston-engine fighters and *Avenger* piston-engine bombers. After 1956, the RCN McDonnell *Banshee* jet fighters participated in this training.¹¹⁹

A second RCAF component to support the MSF was the Mobile Tactical Wing located at Rivers. It initially consisted of three squadrons in 1947 – No. 406 (Light Bomber) Squadron (Auxiliary) from Saskatoon, and two Regular Force squadrons, No. 417 (Fighter Reconnaissance) and No. 444 (AOP) Squadrons. A second Auxiliary light bomber squadron,

(Amended September 1956). See DHH 73/1223 Series 3 File 1304, Chiefs of Staff Committee Minutes of the 412th Meeting, 20 January 1948, “Joint Air School - Rivers - Terms of Reference.”

¹¹⁵ C.L. Heide, “CJATC Rivers,” *The Roundel*, Vol. 13, No. 8, October 1961, and P.M. Simpson, “Introducing the Canadian Joint Air Training Centre,” *The Roundel*, Vol. 7, No. 5, May 1955

¹¹⁶ Heide.

¹¹⁷ Ibid.

¹¹⁸ Leo Pettipas, “Counter-Currents, Co-ordination and Co-operation in Early Cold War Military Aviation,” *Proceedings 5th Annual Air Force Historical Conference/36th CAHS Annual Convention*, 16 Wing Borden, Ontario, June 1999, Winnipeg: Office of Air Force Heritage and History.

¹¹⁹ Leo Pettipas, “Tactical Air Power and Canadian Naval Aviation, 1946-1962,” in W.A. March (ed.), *Sic Itur Ad Astra: Canadian Aerospace Power Studies, Volume 2, Big Sky, Little Air Force*, Trenton: Canadian Aerospace Warfare Centre, 2009.

No. 418 Squadron from Edmonton had been established as one of the original Auxiliary fighter-bomber squadrons in April 1946, though it was re-designated as a light bomber squadron by January 1947. Both squadrons were to operate the *Mitchell* bomber with a unit establishment of eight aircraft until the *Mitchell* was withdrawn from service in 1958.

Originally, two additional Auxiliary squadrons were allocated to support the MSF. No. 402 (Winnipeg) and No. 403 (Calgary) Auxiliary squadrons were designated as fighter-bomber units intended to perform close air support and fighter-reconnaissance tasks in support to the MSF. No. 402 Squadron had been one of the original Auxiliary squadrons formed in April 1946 and was equipped with the *Harvard trainer*. In April 1948, the squadron received a nominal number of *Vampire* jet fighters, but in the Korean War emergency in the Fall of 1950, it exchanged the *Vampires* for *Mustang* piston-engine fighters. No. 403 Squadron had been formed in October 1948 equipped with the *Harvard trainer*. In the Fall of 1950, the squadron received the *Mustang* fighter that remained its principal equipment until the aircraft was withdrawn from service in 1956. In response to the perceived increased air defence threat, these two fighter-bomber squadrons were transferred from the Tactical Air Command to Air Defence Command in November 1953. The two Regular Force squadrons were disbanded in 1948-49, leaving only the ill-equipped Auxiliary squadrons to support the MSF.

The third RCAF component assigned to support the MSF was No. 11 Group HQ (originally in Winnipeg, but moved to Edmonton in August 1951) that acted as the higher HQ for the Mobile Tactical Wing. The transport squadrons of Air Transport Command were the final RCAF element that was key to the viability of the entire MSF concept. The entire aircraft establishment of twenty-seven Dakota *Mk. IV* transports were assigned to support the MSF, and

the introduction of the *North Star* transport added considerable airlift capability.¹²⁰ Though there was training and doctrinal research conducted on land-air operations, in reality, the air component lacked both the adequate air support and airlift to ensure that the MSF, even if it had been at its established strength, was an operationally ready formation.¹²¹

Apart from its responsibility to provide limited airlift support for the MSF, Air Transport Command conducted scheduled twice weekly trans-Canada flights for the movement of military personnel. The Command also continued to conduct photographic survey operations though both No. 413 and No. 422 Squadrons were disbanded in 1949, with only No. 408 Squadron being retained albeit with the much more capable *Lancaster Mk. 10P* aircraft in lieu of the *Dakota* and *Mitchell*.

The organization and employment of maritime aviation was the product of national and inter-service politics, service culture and history.¹²² During the Second World War, there had been no RCN Aviation Branch; RCN personnel wishing to be aviators were seconded to the Royal Navy Fleet Air Arm.¹²³ At the same time, the RCAF adhered to the RAF approach to the command of maritime aviation, with squadrons employed in either Eastern Air Command or Western Air Command as part of the Home War Establishment for the RCAF or serving overseas in RAF Coastal Command.

¹²⁰ The number of *Dakotas* allocated to the MSF is from R.F. Wood, *Strange Battleground: Official History of the Canadian Army in Korea*, Ottawa: Queen's Printer, 1966, p. 18. No. 426 Squadron's initial Unit Establishment (UE) was six *North Star* aircraft.

¹²¹ Stouffer.

¹²² For a general description, see Alfred Price, *Aircraft versus Submarine: The Evolution of the Anti-Submarine Aircraft 1912-1972*, London: William Kimber & Co. Limited, 1973.

¹²³ See J.D.F. Kealy and E.C. Russell, *A History of Canadian Naval Aviation 1918-1962*, Ottawa: Queen's Printer, 1965.

In its proposed post-war fleet, the RCN intended to operate two light-fleet aircraft carriers.¹²⁴ The two-carrier fleet never did materialize, but the RCN managed to keep one aircraft carrier in operation throughout the post-war period until 1970.¹²⁵ Initial post-war RCN aircraft consisted of *Seafire* fighters and *Firefly* reconnaissance fighters already obsolete when they entered RCN service in 1946. The *Seafire* was replaced in 1948 with the considerably more capable *Sea Fury* that was to remain in front line service until 1954.¹²⁶ In 1950, RCN naval aviation received a major upgrade with the approval to purchase seventy-five second-hand US Navy Grumman *Avenger* aircraft. Used as a torpedo bomber during the Second World War, the *Avengers* in RCN service were to be modernized for the anti-submarine role that was now becoming the principal focus of the RCN. It was noted that these aircraft were being acquired for the cost of only two RCAF *Sabre* jet fighters, but provided a considerable improvement in RCN anti-submarine capability.¹²⁷ This purchase was strongly opposed by the RCAF and highlighted the animosity that had existed between the two services since 1946.¹²⁸

From the RCAF perspective, the view was that flying was an Air Force function and the RCN had no mandate to establish a “land based air force” as suggested in RCAF allegations.¹²⁹

¹²⁴ James Eayrs, *In Defence of Canada – Peacemaking and Deterrence, Volume 3*, Toronto: University of Toronto, 1972, p. 87. For an examination of post-war RCN naval aviation, see J.D.F. Kealy and E.C. Russell, *A History of Canadian Naval Aviation 1918-1962*, Ottawa: Queen’s Printer, 1965, and Stuart Soward, “Canadian Naval Aviation, 1915-69,” in James A. Boutilier (ed.), *RCN in Retrospect, 1910-1968*, Vancouver: University of British Columbia Press, 1982.

¹²⁵ HMCS *Warrior* served 1946-48, HMCS *Magnificent*, 1948-56, and HMCS *Bonaventure*, 1957-70. The first two ships were on loan from the Royal Navy, whilst *Bonaventure* was purchased from the RN in 1952.

¹²⁶ The *Sea Fury* was a new aircraft when introduced into the RCN with a number of unresolved issues, a principal one being its engine. See Leo Pettipas, “Toil and Trouble: The Navy’s Fighter Program,” *Proceedings 4th Annual Air Force Conference: 80 Years of Maritime Aviation in Canada*, 12 Wing Shearwater, Nova Scotia, 24-25 August 1998, Winnipeg: Office of Air Force Heritage and History, 1999.

¹²⁷ DHH 73/1223, Series 5, File 2542, Chiefs of Staff Committee, Brief to MND on Naval Aviation, 7 March 1950.

¹²⁸ See DHH 73/1223 Series 3 File 1302, Chiefs of Staff Committee Minutes of the 389th Meeting 6 May 1947, “Aerodrome for Naval Air Units- East Coast.”

¹²⁹ See DHH 73/1223, Series 3, File 1307, Chiefs of Staff Committee, Minutes of the 551st Meeting, 25 November 1953. The issue of who should control naval aviation worked both ways however. There were proposals to transfer all maritime aviation to the RCN raised by senior naval officers, but not supported by the Chief of the Naval Staff—see Stuart Soward, “The Tragedy of Success,” *Proceedings 4th Annual Air Force Conference: 80 Years of Maritime*

The RCAF also posited the opinion that a separate naval air arm could neither be operationally effective nor cost efficient.¹³⁰ From a RCN perspective, the RCAF did not comprehend the special requirements for carrier aviation and had not provided the required support necessary for its shore-based aircraft at RCAF Station Dartmouth. The supposed inequity of command was illustrated by the Dartmouth situation where the RCN utilized eleven aircraft hangars operating fifty-six aircraft with 900 personnel whilst the RCAF operated two hangars, five aircraft and 250 personnel, yet command remained with the RCAF. This situation was eventually rectified with the transfer of Dartmouth to the RCN as HMCS *Shearwater* in December 1948.¹³¹ In response to the RCAF challenge to the very existence of the Aviation Branch, it should be noted that the RCN did provide the sole Canadian air defence resources to the East Coast and contributed a significant anti-submarine capability with its fifty modernized *Avenger* aircraft. The *Sea Fury* and *Banshee* fighters, though purchased primarily for fleet defence, also provided a robust close air support capability, a role for which the RCAF had a minor and declining interest.¹³²

Initial post-war planning had not included the establishment of RCAF maritime squadrons, but after 1948 RCAF plans consistently identified a requirement for three Maritime Patrol squadrons, including one on the West Coast. No. 10 Group Headquarters with a maritime focus had been established at Halifax on 1 March 1947, but No. 2 (Maritime) Operational Training Unit was only formed in November 1949 at RCAF Station Greenwood, with the first

Aviation in Canada, 12 Wing Shearwater, Nova Scotia, 24-25 August 1998, Winnipeg: Office of Air Force Heritage and History, 1999.

¹³⁰ DHH 73/1223, File 2542, Chiefs of Staff Committee, Brief to MND on Naval Aviation, 7 March 1950. From a RCN perspective, the 100 aircraft and the approximately 2,000 personnel (10% of the RCN) in the Aviation Branch were a “bargain” compared to the sixty aircraft and 4,000 RCAF Maritime Air Command personnel. Naval aviation allocation was as follows: 1,355 air service personnel, 782 aircraft carrier crew and 400 civilians, for a total of 2,537.

¹³¹ DHH 73/1223 File 1323 Cabinet Defence Committee, 46th Meeting 14 September 1948, “Shore Facilities for Naval Aviation.”

¹³² Pettipas, “Tactical Air Power and Canadian Naval Aviation, 1946-1962.”

maritime reconnaissance squadron, No. 405 Squadron, being established on 31 March 1950.¹³³

A second maritime reconnaissance squadron, No. 404 Squadron, was established on 30 April 1951 at Greenwood, conducting its first operational flight in August.¹³⁴

RCAF Planning

Early in his tenure as the MND in January 1947, Claxton presented the Cabinet Defence Committee with proposed changes to the Chiefs of Staff Committee responsibilities that placed the planning process within the military domain whilst providing government control through spending and resource allocation, along with placing “trust in the military not to commit the Canadian government to inappropriate activities.”¹³⁵ This type of process was to effectively work with the presence of a strong Minister such as Claxton, trusted senior military Chiefs of Staff such as Lieutenant General Foulkes and Air Marshal Curtis, and civilian participation such as the Undersecretary of State for External Affairs attending meetings. As one who paid attention to the smallest details, Claxton was able to keep matters under his strict control. However, Claxton was to note, “the great danger of planning activities...is that the planners, generally very bright officers...live and work without regard for the facts of national life. Unless they are very closely supervised, they are apt to draw up plans that are utterly unrealistic and impossible of fulfillment. Military planning on this scale sought ideal solutions; military programming invariably has to be aimed much lower.”¹³⁶ The only instance where this process was sidetracked occurred during the “Closing the Gap” discussions when Curtis appeared to be offering the provision of a second air

¹³³ No. 405 Squadron History.

¹³⁴ No. 404 Squadron History.

¹³⁵ Babcock, *The Making of the Cold War Air Force: Planning and Professionalism in the Postwar Royal Canadian Air Force, 1944-1950*, p. 123.

¹³⁶ Bland, *Chiefs of Defence*, p. 244.

division of light bombers to NATO. However, later on after Claxton's tenure, weaknesses in the strategic level planning process adversely affected the RCAF's long-term future.

To provide some coordination to the services' disparate plans (and estimates), an Inter-Service Planning Group was formed and began meetings in December 1946.¹³⁷ However, Air Commodore C.R. "Larry" Dunlap, representing AMAS, argued in light of the government's expenditure cap for a substantial re-allocation of the available defence resources to the RCAF.¹³⁸ According to Babcock, Dunlap's perspective revealed that the RCAF was focused on its own self-interest and was ready to challenge the government on the air force's size.¹³⁹ In addition, it revealed that Dunlap was "a strong and forceful character, traits that the RCAF leadership required to change the fortunes of the air force."¹⁴⁰ Interestingly, the CAS, Air Marshal Leckie disagreed with the requirement to immediately re-allocate resources to the RCAF.¹⁴¹ However, the Chiefs of Staff Committee supported the notion that the RCAF should ultimately be allocated about 50 per cent of the defence budget at some future date.¹⁴² Within the RCAF, Group Captain Robert Ripley noted that the RCAF's failure to date was due to the haphazard approach to planning that was being conducted and this in large part was due to the absence of a full-time planning staff on the Air Staff.¹⁴³ As Babcock notes, "...the future of the air force depended upon the ability to identify and articulate requirements in an effective manner. Planning required the participation of those with strategic vision, capable of foreseeing air force requirements and working out solutions."¹⁴⁴ To correct the deficiencies in the RCAF planning process, a Current

¹³⁷ Ibid. p. 147.

¹³⁸ Ibid. p. 148.

¹³⁹ Ibid. p. 148.

¹⁴⁰ Ibid. p. 148.

¹⁴¹ Ibid. 150.

¹⁴² Ibid. 150.

¹⁴³ Ibid. 151.

¹⁴⁴ Ibid. p. 151.

Plans and Estimates Committee was established in May 1947 subordinate to a new senior Air Staff position, the Air Member Air Plans, an Air Vice Marshal.¹⁴⁵ The Committee, headed by the Deputy AMAP, an Air Commodore, included representation from the Directorate of Organization and Establishment, Directorate of Operational Requirements, Directorate Air Plans 3 and the office of the Deputy Minister DND.¹⁴⁶ The Committee was able to improve air planning by establishing priorities, accurately forecasting requirements and establishing yearly estimates. Eventually, a five-year planning cycle was adopted to provide a more long-term stabilized forecast.¹⁴⁷ Curtis had been the initial AMAP, but he had been the acting CAS for the past year and assumed the CAS position on 1 September 1947, so Dunlap as his deputy had been the acting AMAP and assumed the AMAP position as an Air Vice Marshal when formally vacated by Curtis. Dunlap was to remain in this appointment until 1949 when replaced by Air Vice Marshal A.L. James who was to be involved in the build up of the Big Air Force. With Curtis' intimate background in air force planning, he was able to provide that strategic vision and leadership during his tenure as CAS. This was not to be the case with future CAS appointees in subsequent years.

Planning for the initial post-war RCAF has already been described, but peacetime planning was an iterative process that was continually revised to contend with the evolving strategic (also political and fiscal) environment. Post-war RCAF plans developed from Plan A to Plan H during the period from December 1945 to August 1952. Initial post-war planning was based on the usage for five years of existing aircraft types, though subsequently there were

¹⁴⁵ Ibid. p. 165.

¹⁴⁶ Ibid. pp. 165-166.

¹⁴⁷ Ibid. pp. 243-244.

substitutions for modern aircraft such as the *Vampire* replacing the *Spitfire*.¹⁴⁸ One can view the evolution of these various plans with Plan B representing a modest but still ambitious approach, Plan E representing the constrained fiscal reality of 1947-48 and Plan F reflecting the more dangerous international situation of 1948-49 and hence the need for large air power planning. Plan E, for example in July 1948, illustrated the reality of the existing weakness of the RCAF to provide for the nation's air defence. Randall Wakelam noted

The RCAF owned 28 *Mustangs* and 10 in service, against an operational requirement for 36. There were 81 *Vampires* on the books with 23 in service, against a requirement for 57...[Air Marshal Wilf Curtis] had already presented a request to the CDC [Cabinet Defence Committee] for the purchase of an additional 27 *Vampires* to ensure adequate stocks to cover increased operational needs...and attrition until 31 March 1951.¹⁴⁹

The increasing international tensions throughout 1948 resulted in further developments for the RCAF both for its planned peacetime structure and wartime mobilization. The result was the promulgation of Plan F (October 1948) that has been described as “easily the most comprehensive RCAF plan to date. It included a detailed examination of operational and training requirements and provided extensive expenditure proposals which allowed the government to identify the cost of each air force role.”¹⁵⁰ By 1953/54, Plan F envisaged the RCAF to consist of twenty Regular and twelve Auxiliary squadrons.¹⁵¹ The Regular squadrons were to consist of nine fighter, one medium bomber, three maritime, three transport, one long-range transport, one transport survey and two long-range reconnaissance (photography) squadrons. The Auxiliary squadrons would comprise ten fighter and two tactical bomber

¹⁴⁸ Randall Wakelam, *Cold War Fighters: Canadian Aircraft Procurement, 1945-54*, Vancouver: University of British Columbia Press, 2011, p. 55.

¹⁴⁹ Ibid. p. 55. During this period, the Air Staff was tasked with identifying RCAF deficiencies that could be passed to the government for possible procurement. Air Commodore W.A. Orr, Deputy Air Member for Plans (Organization) identified a requirement to 1953 amounting to 320 *Vampire* and 342 *CF-100* fighters (p. 56).

¹⁵⁰ Babcock, *The Making of the Cold War Air Force: Planning and Professionalism in the Postwar Royal Canadian Air Force, 1944-1950*, p. 190.

¹⁵¹ Ibid. Table 5: Plan F Squadron Allocation, p. 192

squadrons.¹⁵² The total peacetime aircraft establishment requirements would consist of 384 aircraft, including 228 fighters and sixteen bombers, expanding in wartime to 639 aircraft, including 475 fighters and forty-four bombers.¹⁵³

The continuance of increased tensions in Europe prior to the outbreak of the Korean War precipitated the development of Plan G that was originally approved by the Cabinet on 20 February 1950.¹⁵⁴ Upon the outbreak of the Korean War, further changes to Plan G were initiated with the revised version being promulgated 1 September 1950.¹⁵⁵ The intent of the revised Plan G was to build up the RCAF to a force structure of sixteen Regular squadrons at War Establishment (WE) and twelve Auxiliary squadrons at half war strength by 1 December 1953 or sooner if possible.¹⁵⁶ The revised Plan G increased the number of fighter squadrons in Air Defence Command from three to six day fighter squadrons each with twenty-five *Sabres* and from two to three *CF-100* all-weather squadrons each with eighteen aircraft.¹⁵⁷ The three additional *Sabre* squadrons were intended for overseas service. Maritime Air Group was to be increased from two to three Maritime Patrol squadrons each with twelve *Lancasters*, with the third squadron being allocated to the West Coast.¹⁵⁸

Priorities for implementation of the revised program were assigned over a three-year period from August 1950 to December 1953.¹⁵⁹ Earlier estimates of the potential direct threat of Soviet nuclear weapons being capable of striking North America were revised from the original date of 1956/57 based on Soviet progress in the development of nuclear and thermonuclear

¹⁵² Ibid.

¹⁵³ Ibid.

¹⁵⁴ DHH 96/24, Plan "G" for the RCAF, 1 September 1950.

¹⁵⁵ Ibid.

¹⁵⁶ Ibid. Section "A," Green Tab 1, p. 2.

¹⁵⁷ DHH 96/24, Plan "G" for the RCAF (1 September 1950), Serial No 4 10 Aug 50 as amended by Serial No 84 11 Aug 50, p. 1.

¹⁵⁸ Ibid. p. 2.

¹⁵⁹ Ibid. pp. 5-6.

weapons.¹⁶⁰ This threat highlighted the importance of air defence forces to protect vital areas in cooperation with the US. Revised estimates on the build up of the Soviet submarine fleet also justified the build-up of Maritime Air Group that expanded to become Maritime Air Command in 1953.¹⁶¹ However, “the possible threat of small-scale, Commando-type raids” necessitated RCAF tactical and transport elements to be organized into Tactical Air Command in 1953 to support the Canadian Army’s MSF.¹⁶² In addition to these three peacetime tasks that also had a wartime role, two additional wartime tasks included the provision of reinforcements for overseas operations and the contribution to “the execution of strategic air offensive operations.”¹⁶³ An important aspect of Plan G was the inclusion of planning for mobilization of the RCAF in the event of war and the maintenance of a relatively large reserve organization.¹⁶⁴ The Regular Force structure included 204 day and all weather fighters, forty-eight long-range maritime and area reconnaissance aircraft, and forty-four medium, heavy tactical and long-range transport aircraft.¹⁶⁵ The Auxiliary squadron structure was based on a total of seventy-two trainer, 120 fighter and sixteen tactical bomber aircraft.¹⁶⁶ The progressive build up of the RCAF during 1948-50 is illustrated at **Table 3-2** below, showing only the expansion of the RCAF Regular and Auxiliary combat elements.

Table 3-2 - Comparison - Development RCAF Planning 1948-1950 – Combat Units		
Force Structure		Aircraft
Plan E		
Regular	2 x Fighter	8 <i>Vampire</i> , 4 <i>Harvard</i>

¹⁶⁰ DHH 96/24, Plan “G” for the RCAF (1 September 1950), Section “A,” Green Tab 2, p. 1.

¹⁶¹ Ibid. p. 1.

¹⁶² Ibid. p. 1.

¹⁶³ DHH 96/24, Plan “G” for the RCAF (1 September 1950), Section “B,” Blue Tab 1, p.1.

¹⁶⁴ DHH 96/24, Plan “G” for the RCAF (1 September 1950), Section “C,” Pink Tab 1.

¹⁶⁵ DHH 96/24, Plan “G” for the RCAF (1 September 1950), Section “B,” Blue Tab 3.

¹⁶⁶ DHH 96/24, Plan “G” for the RCAF (1 September 1950), Section “C,” Pink Tab 4.

Squadrons (36 aircraft)	1 x Fighter Reconnaissance	8 <i>Mustang</i> , 4 <i>Harvard</i>
Auxiliary Squadrons (120 aircraft)	7 x Fighter 1 x Fighter 5 x Fighter 2 x Tactical Bomber	8 <i>Vampire</i> , 4 <i>Harvard</i> 12 <i>Harvard</i> No Aircraft 8 <i>Mitchell</i> , 4 <i>Harvard</i>
Plan F		
Regular Squadrons (164 aircraft)	9 x Fighter 1 x Medium Bomber 4 x Maritime/Reconnaissance	12 <i>Vampire/Sabre/CF-100</i> 8 Medium Bomber 12 <i>Lancaster</i>
Auxiliary Squadrons (136 aircraft)	10 x Fighter 2 x Tactical Bomber	12 <i>Vampire/Mustang</i> 8 <i>Mitchell</i>
Plan G		
Regular Squadrons (252 aircraft)	6 x Day Fighter 3 x All Weather Fighter 3 x Maritime/Reconnaissance	25 <i>Sabre</i> 18 <i>CF-100</i> 12 <i>Lancaster</i>
Auxiliary Squadrons (208 aircraft)	8 x Fighter 2 x Fighter-Bomber 2 x Tactical Bomber	12 <i>Vampire</i> , 6 <i>Harvard</i> 12 <i>Vampire</i> , 6 <i>Harvard</i> 8 <i>Mitchell</i> , 6 <i>Harvard</i>

Canadian Aircraft Industry

During the inter-war period, the Canadian aircraft industry was negligible with a work force of 1,000 who annually produced only forty aircraft. However, the industry expanded to an unprecedented size during the course of the Second World War with 122,000 workers who manufactured 16,448 aircraft during the six years of the war.¹⁶⁷ Early in the war, it was believed that Canada's industrial output, including its aircraft production, might be the nation's major contribution to the war effort. Apart from the production of thousands of trainer aircraft to equip the BCATP training schools, the industry was also engaged in the production of combat aircraft to assist its major allies, the US and the UK. A major lesson learned from the experience during the Second World War was that the Canadian aircraft industry was not always geared towards producing the necessary aircraft to meet Canadian requirements.¹⁶⁸ In a similar manner, the Allied aircraft industry often had the RCAF much further down the production line behind the US and UK air forces regardless of the perceived strategic necessity of aircraft for the RCAF.¹⁶⁹ W.A.B. Douglas points out that Canadian *Hurricane* production was focused on supplying the RAF not the RCAF for home defence and the US produced *Liberator* bomber for the RCAF Bomber-Reconnaissance role in Canadian coastal waters was a long time coming after meeting US and British requirements.

In planning for the establishment of the post-war aircraft industry, the emphasis was not necessarily on military aircraft. C.D. Howe, the Minister and his Department of Munitions and Supply (DMS) had a vision for the post-war industry that did not coincide with RCAF military

¹⁶⁷ Lawrence Aronsen, " 'A Leading Arsenal of Democracy': American Rearmament and the Continental Integration of the Canadian Aircraft Industry, 1948-1953," *The International History Review*, Vol. XIII, No. 3, August 1991.

¹⁶⁸ One example was the production of the Curtiss *Helldiver* naval dive-bomber exclusively for the US Navy.

¹⁶⁹ W.A.B. Douglas, "The Air Defence Dilemma in Canada, 1939-1943," *Canadian Defence Quarterly*, Vol. 14, No. 2, Autumn 1984 and Fred Gaffen, "Canada's Military Aircraft Industry: Its Birth, Growth and Fortunes," *Canadian Defence Quarterly*, Vol. 15, No.2, Autumn 1985.

requirements.¹⁷⁰ In post-war planning for the aircraft industry, Howe wanted to focus the industry on the development and production of civil, not military, aircraft. The aircraft industry had a strong focus in the industrial heartland of Canada with companies such as Canadair and Canadian Car and Foundry in the Montreal area, and de Havilland Canada and Avro Canada in the Toronto area. However, there were hundreds of suppliers located across the country, along with major aircraft repair and overhaul facilities in other large urban centres such as Vancouver, Winnipeg, Edmonton and Halifax.¹⁷¹ Canadair's initial post-war focus was on converting wartime *Dakota* military transports into civil airliners to handle the increased of civilian air travel in Canada.¹⁷² The other major Canadian aircraft manufacturers were also focused on the design and production of civil aircraft. De Havilland Canada designed and produced the DHC-1 *Chipmunk* primary trainer intended for flying clubs and the RCAF, and more importantly, the DHC-2 *Beaver*, which became the quintessential bush plane.¹⁷³ Avro Canada, though it had been awarded the contract to develop and produce a Canadian jet fighter, was also engaged in the development of a civil jet transport, the Avro *Jetliner*.¹⁷⁴ Eayrs wrote "At its disposal [the RCAF] were thousands of aircraft – *Spitfires*, *Hurricanes*, *Mosquitos* and *Lancasters* – all of them out of date."¹⁷⁵ However, despite the planned development and acquisition of modern jet fighters such as the *Sabre* and *CF-100*, the RCAF was to utilize hundreds of modernized and

¹⁷⁰ Jeff Noakes, *The Air Staff Makes Plans for the Postwar Aircraft Industry, 1941-1945*, Unpublished paper presented at the 2001 Conference of the Society for Military History, Calgary, AB.

¹⁷¹ For example, Fairey Aviation of Canada was located in Halifax, North West Industries in Edmonton, and the Bristol Aeroplane Company of Canada Ltd in Montreal, Winnipeg and Vancouver. See "The Canadian Industry" and "The Canadian Industry: Ancillary Companies," *Flight*, 24 August 1956.

¹⁷² Ron Pickler and Larry Milberry, *Canadair: The First 50 Years*, Toronto: CANAV Books, 1995, pp. 36-48.

¹⁷³ Fred W. Hotson, *de Havilland in Canada*, Toronto: CANAV Books, 1999. For development of the *Chipmunk*, see pp. 115-120 and for the *Beaver*, see Chapter 5. Early in the post-war period, de Havilland also was engaged in the refurbishment of wartime *Canso* amphibious aircraft.

¹⁷⁴ Jim Floyd, *The Avro Canada C102 Jetliner*, Erin, Ontario: The Boston Mills Press, 1986.

¹⁷⁵ Eayrs, *In Defence of Canada – Volume 3*, p. 97.

reconditioned Second World War aircraft such as the *Harvard*, *Mitchell*, *Lancaster*, *Dakota*, *Canso*, and *Expeditor* until the 1960s and beyond.

Historian Jeffrey Noakes has suggested that the RCAF leadership had considerably more influence on development and procurement than has been previously acknowledged.¹⁷⁶ Within the RCAF, there were differing views on the approach that the RCAF should undertake. On one hand, Air Vice Marshal E.W. Stedman, the Director General of Air Research (DGR) supported development of a civil airliner that coincided with the approach of the DMS. On the other hand, Air Vice Marshal A. Ferrier, the Air Member for Aeronautical Engineering (AMAE), supported the development of aircraft intended for RCAF use. Indeed, the initial Canadian designed and produced aircraft was the *Canadair North Star* four-engine long range transport, though undoubtedly useful to the RCAF, was intended for use by Canada's civil airlines.¹⁷⁷ The *North Star* based on the Douglas *DC-4* and *DC-6*, but powered by British Rolls-Royce *Merlin* engines, went into service with the RCAF, Trans-Canada Airlines, Canadian Pacific Airlines and the British Overseas Airways Corporation. However, at the same time, agreement was obtained to support the development of a Canadian jet fighter. Another part of the RCAF thrust was the need to develop Canadian designed and produced jet engines.¹⁷⁸

The RCAF promulgated its aircraft procurement policy in 1949 based on the premises that: “ a) a sound aircraft industry must be maintained in Canada. b) the RCAF cannot afford to depend upon overseas supply sources for major items of equipment if comparable is available on

¹⁷⁶ Noakes. He bases this change in perception from Wakelam's research on fighter procurement during the late 1940s and early 1950s.

¹⁷⁷ DHH 74/628, Folder “G,” 1945. Minutes of Meeting Held in Connection with Production of DC4 Aircraft by Canadair, Montreal for the RCAF,” (29 March 1945). File S.60-3-33 (AMSO/DAE) 5 April 1945. Even prior to the conclusion of the Second World War, the RCAF was planning the build up of its strategic air transport capabilities. See Larry Milberry, *The Canadair North Star*, Toronto: CANAV Books, 1982.

¹⁷⁸ For the origins and early development of jet engines in Canada, see Greig Stewart, “Canada and the Development of the Aircraft Jet Engine: Present at the Creation – But Not Long Enough Thereafter,” *Canadian Defence Quarterly*, Vol. 9, No. 1, Summer 1979.

this continent.”¹⁷⁹ This policy was established on the results of the RCAF experiences of the Second World War. Another “lesson learned” from this wartime experience was the necessity of manufacturing aircraft engines in Canada, an activity that had not occurred during the war, leaving Canada dependent on foreign suppliers.¹⁸⁰ The perceived capabilities of the Canadian aircraft industry knew no limitations with the development of the Avro Canada *CF-100* jet fighter and the *Jetliner* and the licensed production by Canadair of the North American *Sabre* jet fighter, the most advanced fighter of the time.¹⁸¹ An example of this unbounded confidence was revealed during the negotiations between the Canadian government and North American Aviation on licence production of the *Sabre*. The negotiations had resolved all but one of the issues – that concerning the production of the wing and spar components of the airframe that in the view of “Dutch” Kindelberger, president of North American Aviation, was beyond the capabilities of the Canadian aircraft industry. C.D. Howe was quite willing to go along with Kindelberger that these components could be shipped from Los Angeles. However, Air Marshal Wilf Curtis adamant that these components should be manufactured in Canada, won the argument.¹⁸²

In response to the increasing international tensions, there was also a greater emphasis on the maintenance of a healthy Canadian aircraft industry.¹⁸³ Apart from the obvious improvement towards standardization with US industry, Lawrence Aronsen suggested that this was just part of the integration of the Canadian aircraft industry with its US counterpart because the costs of

¹⁷⁹ R.V. Dodds, “R.C.A.F. Aircraft Procurement Policy,” *The Roundel*, Vol. 2, No. 1, November 1949.

¹⁸⁰ This engine production deficiency was corrected with the development and manufacture of Orenda engines. See Paul B. Dilworth, “Ab Initio to World Class: Canada’s Bid as a Jet Engine Leader – Conclusion,” *CAHS Journal*, Vol. 38, No. 3, Fall 2000.

¹⁸¹ Larry Milberry, *The Canadair Sabre*, Toronto: CANAV Books, 1986. The prototype Canadair *Sabre Mk. 1* first flew 9 August 1950.

¹⁸² Eayrs, *In Defence of Canada, Volume 3*, pp. 104-105.

¹⁸³ Aronsen.

Canadian production to meet just the needs of the RCAF was not economical; longer production runs were essential.¹⁸⁴ However, it would be incorrect to suggest that the decision to license-produce the *Sabre* was part of the integration of the industry with the US and rejection of continued acquisition of the *Vampire* fighter represented a turning away from British industry.¹⁸⁵ Jack Granatstein advanced such an argument -- how Britain's weakness drove Canada into the arms of the US (the so-called "Americanization" of the RCAF). The evidence in the case of both the aircraft industry and the RCAF, however, would suggest that the earlier historical links with the UK and the strengthening of those linkages during the Second World War remained strong throughout the 1950s.¹⁸⁶ In the case of the *Sabre*, it was a matter of selecting the best aircraft. The *Vampire* was useful in introducing jet aircraft into the RCAF, but it was obsolete, and did not serve in an operational environment.

The RCAF and the Defence Budget

Essential to the expansion of the RCAF after 1948 was the great increase in defence spending and the RCAF allocation within that budget. From **Table 3-3**, it can be noted that the RCAF experienced a fifty per cent increase in its 1948-49 budget that reflected the early expansion and increased tempo.¹⁸⁷

¹⁸⁴ Ibid.

¹⁸⁵ Ibid.

¹⁸⁶ This has been a constant theme of Granatstein for many years. See *How Britain's Weakness Forced Canada into the Arms of the United States: The 1988 Joanne Goodman Lectures*, Toronto: University of Toronto Press, 1989, "The American Influence on the Canadian Military, 1939-1963," in B.D. Hunt and R.D. Haycock, *Canada's Defence: Perspectives on Policy in the Twentieth Century*, Toronto: Copp Clark Pittman, 1993. "From a Mother Country to Far Away Relative: The Canadian-British Military Relationship from 1945," *Canadian Military History*, Vol. 18, No 1, Winter 2009. In my view, Granatstein has been successfully corrected by Peter Archambault, *The Informal Alliance: Anglo-Canadian Defence Relations, 1945-1960*, Unpublished PhD Thesis, Calgary: University of Calgary, April 1997.

¹⁸⁷ See Air Commodore R.C. Ripley, "How the Air Force Spends its Money," *The Roundel*, Vol. 1, No. 8, June 1949.

Table 3-3 - Comparison RCAF and DND Budgets 1946-1950 (as Percentage of Total Budget)		
Fiscal Year	RCAF	DND Total
1946-47	\$99m (26%)	\$387m
1947-48	\$60m (25%)	\$240m
1948-49	\$90m (34%)	\$268m
1949-50	\$136m (40%)	\$344m

Within the DND total budget, there was a definitive trend in favour of the RCAF. This upward trend of the RCAF allocation was to continue, peaking at fifty-six per cent of the DND budget in Fiscal Year 1953-54 and thereafter remaining more than one-half of the total DND budget until 1962-63, declining to forty-seven per cent by 1965-66 (See **Table 5-7** in Chapter 5).¹⁸⁸

RCAF personnel strength increased only gradually. Because of the lead-time to recruit and train personnel, the expansion was only starting to manifest itself in the Fiscal Year 1949-50 as illustrated at **Table 3-4**.

Table 3-4 - RCAF Personnel Strength 1946-1950 ¹⁸⁹		
Fiscal Year	Regular Force	Auxiliary/Reserve
	Officers/Airmen/Total	Officers/Airmen/Total
1946-47	2,140/10,487/12,627	

¹⁸⁸ See Department of Finance, *Public Accounts*, in John Warnock, *Partner to Behemoth: The Military Policy of a Satellite Canada*, Toronto: New Press, 1970, p. 324.

¹⁸⁹ Personnel strengths obtained from the annual *Report of the Department of National Defence*, Fiscal Years 1946-47, 1947-48, 1948-49, and 1949-50.

1947-48	2,076/9,941/12,017	247/497/744
1948-49	2,701/11,851/14,552	429/998/1427
1949-50	2844/14131/17274* Total includes 299 Flight Cadets	624/1733/2369* Total includes 12 Flight Cadets. Add 837 Flight Cadets (University Air Training Plan).

Conclusions

For Canadians who believed that the post-Second World War focus of the nation would be on implementing the Report on Social Security in Canada (the Marsh Report), the renewed emphasis on military expansion to meet the challenges of the emerging Cold War must have caused disillusionment. Canada's international responsibilities were clearly stated by Louis St. Laurent, then the Secretary of State for External Affairs, in the 1947 Gray Lecture presented at the University of Toronto on 13 January.¹⁹⁰ Claxton's 17 February memorandum on "Canada's defence" was certainly synchronized with the position set forth by St. Laurent. An appreciation of air-mindedness by the key decision makers in Ottawa was the essential factor that provided an environment that allowed the development of air power to prosper in political, defence and industrial circles. Though the Soviet threat based on strategic bombers became a focus by 1948, the RCAF still did not abandon the principle of establishing a balanced air force encompassing all six air power functions. In addition, Possony's elements of air power, though often existing in embryonic form during this period, still were part of the RCAF's framework. One weakness that ultimately was to adversely affect future RCAF planning was the absence of a strategic-level

¹⁹⁰ Tim Cook, *Warlords: Borden, Mackenzie King, and Canada's World Wars*, Toronto: Allen Lane, 2012, p. 346.

“thinking” framework – an issue that becomes apparent with the expansion of the 1950s.¹⁹¹ A criticism at the time was the absence of a Canadian version of President Truman’s Air Policy Commission of 1948.¹⁹² Whether such an approach would have resulted in an avoidance of later strategic difficulties will be explored in subsequent chapters.

The period 1945-1950 represented one of transition for the RCAF. Assessed within the framework of the three pillars, there had been some gains and losses. In the political sense, it was certainly recognized that the RCAF was the third service equal with the Canadian Army and RCN, unlike the pre-war situation, and there was now the emerging trend of the RCAF’s prime importance in Canadian defence. In addition, conscious government decisions to pursue a national aircraft strategy were generally well supported and sensible. Unlike a later criticism that defence in general and the services in particular were driven by Alliance requirements, the RCAF in the late 1940s was focused on meeting Canadian strategic requirements. However, the reality of the late 1940s was that the RCAF was ill prepared to effectively contribute to the national defence – the deficiencies of this situation were well publicized at the time with *Exercise Eagle*, a MSF event held in August 1949.¹⁹³ Despite the RCAF’s immediate lack of modern equipment, the decisions to proceed with the development and production of the Avro Canada *CF-100* and the licensed production of the Canadair *Sabre* acknowledged the importance of advancing technology and represented a critical forward step in the soon to emerge Big Air

¹⁹¹ Critics of the RCAF’s lack of a true strategic culture include Scot Robertson, “Reflections on the Canadian Experience,” in James G. Fergusson, *Aerospace Power: Beyond 100 Years of Theory and Practice*, Silver Dart Canadian Aerospace Studies, Volume 1, Winnipeg: Centre for Defence and Security Studies, University of Manitoba, March 2005, and Stephen L. James, “The Air Force’s Cold War Struggle with its National Purpose,” 3rd *Air Force Historical Conference 1997*, Winnipeg: Department of National Defence, Office of Air Force Heritage and History, 1998.

¹⁹² See Ronald A. Keith (Editor), “We Need a ‘Survival’ Report for Canada,” *Canadian Aviation*, Vol. 21, No. 4, April 1948.

¹⁹³ See Ronald A. Keith, “‘Eagle:’ Object Lesson in Air Defense,” *Canadian Aviation*, Vol. 22, No. 9, September 1949, and A.F. Hailey, “‘Eagle:’ With Tattered Wings,” *Canadian Aviation*, Vol. 22, No. 9, September 1949.

Force concept. The RCAF's paucity of operational capabilities, especially combat power, was a reflection of politics, fiscal reality, strategic uncertainty and the rapid progression of aircraft technology. However, this situation was to quickly change on 25 June 1950.

Chapter 4

Canadian Air Power – European Build Up 1950-1957

Introduction

The outbreak of the Korean War on 25 June 1950 was the catalyst that changed the perspective of the government and DND towards the maintenance of armed forces in peacetime. This new perspective was to affect governments and the armed forces for the next forty years. In the case of the RCAF, policies were enacted that made it the largest service until the end of the Cold War, and from 1951 until the mid 1960s, fully one half of the DND budget was allocated to the RCAF. The Big Air Force was set into play with the 5 February 1951 announcement by Brooke Claxton of a three-year \$5 billion defence build up with an emphasis on air power.

Although this chapter will focus on the RCAF contribution to NATO, No. 1 Air Division, it is first necessary to examine the outbreak of the Korean War in June 1950 and the Canadian response. The chapter will then review the RCAF planning for expansion in 1950 and 1951 in Plans G and H. The bulk of Chapter 4 will examine the establishment of No.1 Air Division, the 1952 NATO Lisbon Conference, “Closing the Gap” discussions and the proposal for a second RCAF Air Division, the transformation of NATO strategy and its impact on airpower, the importance of logistics in the Air Division’s readiness and capability, and conclude with the examination of the planning for a Soviet –NATO air war.

The deployment of RCAF squadrons overseas was a milestone that created the third largest “European” air force after the United States Air Forces in Europe (USAFE) and RAF Germany. It was not only the size of the RCAF contribution that counted. In terms of quality, the RCAF No. 1 Air Division, with twelve squadrons equipped with the Canadair *Sabre*,

represented the zenith of advanced air power in the early 1950s, and was essential for Western European defence. The establishment of the Air Division as the very visible RCAF contribution to NATO was initially the top priority in the making of the Cold War air force. The build up of RCAF air power in its home based establishment, particularly Air Defence Command, was the focus for expansion in the second half of the 1950s, and will be discussed in the following chapters.

Outbreak of the Korean War and the Canadian Response

Though increasing tensions in Europe and the detonation of a Soviet atomic bomb in 1949 had provided an impetus for limited Canadian re-armament, it was the outbreak of the Korean War on 25 June 1950 that was the catalyst for the creation of the Big Air Force.¹ The North Korean invasion revealed the RCAF's inability immediately to respond to the needs of collective security with a contribution of combat aircraft.² RCAF holdings of aircraft potentially useful for combat totalled eighty-five *Vampire* jet fighters and thirty *Mustang* piston-engine fighters, along with fifty-nine *Mitchell* and over 200 *Lancaster* wartime bombers, including stored aircraft.³

¹ See Robert Bothwell, *The Big Chill: Canada and the Cold War*, Toronto: Irwin Publishing, 1998. Bothwell suggests that "Korea was the occasion, but it was not the main cause or object of Canada's defence effort.... With the testing of an atomic bomb by the Soviet Union in 1949 and as tensions continued to grow between the Soviet Union and the West, NATO member-states took steps to establish a military arm." (p. 40). Bothwell seriously underestimates the impact of the surprise attack in Korea on Western (including Canadian) defence. It was after the outbreak of the Korean War that concrete steps to establish an integrated force in NATO were acted upon and only then did the Canadian government undertake this massive three-year \$5 billion re-armament programme deciding to deploy troops and aircraft overseas in Europe.

² RCAF operational combat aircraft at this time were limited to *Mustang* and *Vampire* fighters. Though United Nations air forces made wide use of the *Mustang* during the early part of the war, the *Vampire* did not see service in this theatre.

³ At this time, a total of sixteen *Mitchell* light bombers equipped two Auxiliary Squadrons, while approximately 100 *Lancaster* aircraft were undergoing modernization for maritime reconnaissance, photographic, and search and rescue roles.

The initial Canadian contribution to the United Nations' efforts was the dispatch of three RCN destroyers, announced on 29 June. In the meantime, No. 426 Squadron undertook preparations in advance of its being tasked to participate.⁴ On 12 July, the CAS wrote to the AOCs of Air Transport Command and Air Materiel Command to advise that since the USAF did not have sufficient airlift, RCAF participation would be welcomed. Cabinet approval for the provision of the long-range transport squadron was granted on 19 July, and the CAS issued direction for the integration of No. 426 Squadron into the USAF Military Air Transport Service (MATS) under its operational control, bringing the Unit Establishment (UE) to its wartime level of twelve *North Star* aircraft and noting that RCAF aircraft were not to operate in Korea. On 25 July, the first six aircraft departed from Dorval for McChord Air Force Base, Washington where the squadron conducted airlift operations over the next four years between McChord and Kaneda Air Base in Japan. As No. 426 Squadron did not operate in the Korean theatre, this contribution was not recognized in non-Canadian accounts of the air war in Korea. At the low point for the United Nations forces in December 1950 when they were being pushed south by Chinese Communist Forces, there was the possibility that No. 426 Squadron might be involved in air operations in Korea to assist with the evacuation of the UN forces.⁵ Fortunately from both the government's and the RCAF perspectives, this situation did not develop. However, apart from the USAF and the RAF, the RCAF was the only participating air force in the Korean War capable of providing a strategic transport capability using its *North Star* transports. The RCAF Air Transport Command had demonstrated this capability in January 1950 with its first around-

⁴ Lawrence Motiuk, *Thunderbirds for Peace: Diary of a Transport Squadron*, Ottawa: Larmot Associates, 2004.

⁵ DHH 73/1223 Series 2, File 2559, Brooke Claxton, Memorandum for the Prime Minister, 5 December 1950.

the-world flight that carried External Affairs Minister Lester Pearson to the Commonwealth meeting in Colombo, Ceylon (now Sri Lanka).⁶

The expansion of the RCAF for the remainder of the 1950-51 Fiscal Year (ending 31 March) was quite limited. In August 1950 the US government responded positively to a 1949 request for the purchase of 100 *Mustang* fighters.⁷ Three additional fighter squadrons were authorized with a mixture of available aircraft – No. 411 Squadron (Auxiliary) at Downsview on 1 October 1950 equipped with *Harvard* trainers, and two Regular Force squadrons, No. 416 Squadron (*Mustangs*) at Uplands on 8 January 1951, and No. 441 Squadron (*Vampires*) at St Hubert on 1 March 1951.⁸ As a result of the Korean emergency, most of the *Vampire* fighters that had equipped the Auxiliary squadrons were withdrawn and re-assigned to the Regular Force squadrons to bolster their strength.⁹

Re-equipment of the Auxiliary squadrons with the *Mustang* commenced in November 1950 for Nos. 402, 403, 420, 424 and 442 Squadrons. In the process, Nos. 402 and 442 Squadrons relinquished their *Vampires*. However, re-equipment did allow for a larger Unit Establishment with the *Mustang*. For example, No. 442 Squadron increased its strength from four *Vampire* fighters to twelve *Mustang* fighters.¹⁰ For the other three squadrons, delivery of the *Mustang* represented an improvement from the previously operated *Harvard* trainers, and though

⁶ Motiuk.

⁷ Jim Lyzun, "Maple Leaf Mustangs: P-51Ds and 'Ks in Canadian Service," *Air Enthusiast*, No. 93, May-June 2001, p. 47. See "First Five Mustangs Arrive for RCAF," *Canadian Aviation*, Vol. 23, No. 11, November 1950.

⁸ During the period of 1950-52, RCAF re-equipment proceeded at a dizzying pace as witnessed by the rapid re-equipment of these squadrons. RCAF Regular fighter squadrons re-equipped from *Mustangs* and *Vampires* to *Sabres* and *CF-100s*, while some Auxiliary squadrons re-equipped from *Harvards* to *Mustangs* and *Vampires*.

⁹ Lyzun, p. 54.

¹⁰ Grant MacDonald and Terry Strocel, *442 Squadron History*, Comox: 442 Transport and Rescue Squadron, 1987, p. 59.

the *Mustang* did not represent the most modern equipment, it was the best equipment then available to the RCAF.

It would be some time before the more advanced Avro Canada *CF-100* and Canadair *Sabre* fighters would be available for service. In the case of the *CF-100*, the prototype first flew on 19 January 1950 and the first aircraft for the RCAF was delivered on 17 October 1951. However, developmental problems with the *CF-100* delayed the first deliveries to the Operational Training Unit until July 1952, with the first operational squadron only being formed in August 1953.¹¹ One casualty in the efforts to hasten the *CF-100* programme was the eventual cessation on the development of the Avro Canada *C102 Jetliner*.¹² In the case of the *Sabre*, a fully developed design, the prototype Canadair machine first flew on 8 August 1950 with the initial production version, the *Sabre Mk.2*, first flying on 2 January 1951. The initial squadron, No. 410 Squadron received its *Sabres* starting in May 1951 and was ready to deploy to England by November 1951.¹³

In a similar manner to her sister Commonwealth air forces such as Australia and South Africa, the RCAF could perhaps have offered a squadron of *Mustang* piston-engine fighters, a type of aircraft that was desperately needed in the first months of the war in the Close Air Support (CAS) and interdiction roles.¹⁴ However, this type of contribution would have weakened

¹¹ Larry Milberry, *The Avro CF-100*, Toronto: CANAV Books, 1981.

¹² Jim Floyd, *The Avro Canada C102 Jetliner*, Erin, Ontario: The Boston Mills Press, 1986, see pp. 89-90, 98-99 and 109 for a discussion to terminate the *Jetliner's* development. The *Jetliner* represented another example of "what could have been" for both the Canadian aircraft industry and the broader Canadian experience. Whereas the Avro *Arrow* lives on in Canadian historical mythology, undoubtedly assisted by the nature of its demise by the Diefenbaker government, the Avro *Jetliner* was quietly shelved. The *Jetliner* had the distinction of being the second civil jetliner in the world to fly - two weeks later than the British De Havilland *Comet* - and the first in North America (pp. 136-137).

¹³ Larry Milberry, *The Canadair Sabre*, Toronto: CANAV Books, 1986.

¹⁴ See B. Lyman, *The Significance of Australian Air Operations in Korea*, Air Power Studies Centre, Paper No. 2, RAAF Fairbairn, ACT, March 1992. Lyman argues that the RAAF contribution of a *Mustang* squadron (replaced with *Meteor* jet fighters) demonstrated the political utility of air power for Australia.

home defence and by the time that a fully trained squadron could have been dispatched overseas, the *Mustang* had been replaced by more modern aircraft. More important, there is no evidence the government considered the contribution of a RCAF combat squadron in the early stages of the war, though the possibility of dispatching a *Sabre* jet fighter squadron arose at a later date.¹⁵ In the end, the RCAF combat contribution to the air war in Korea consisted of twenty-two fighter pilots flying in exchange positions with USAF *Sabre* squadrons.¹⁶ Additional contributions included forty RCAF Flight Nurses who served with the USAF on aero-medical evacuation flights, one RCN fighter pilot on exchange with the US Navy, sixteen Canadian Army officers who served as Forward Air Controllers with the USAF, and four Canadian Army pilots who served with the AOP Flight in the 1st Commonwealth Division.¹⁷

Canada and NATO

Western governments viewed the invasion of the Republic of Korea as the prelude to an invasion of Western Europe by the Soviets, and the Korean War acted as the impetus for the build-up of air forces on the European continent. The Western European economies were still suffering from the consequences of six years of war and the maintenance of effective armed forces assumed a relatively low priority. Among the European nations that maintained armed forces, considerable numbers of troops were engaged in the various conflicts associated with

¹⁵ DHH 73/1223, File 2000, Minutes of a Conference of Air Officers' Commanding, 17-18 January 1952, p. 6. The issue of sending a RCAF *Sabre* squadron arose during the AOC Conference held on 17-18 January 1952. The government did not favour sending a squadron to Korea, as any commitment would have meant a reduction in the European contribution. If the Korean War had continued into 1954, there was a proposal to deploy a RCN squadron of twelve *Sea Fury* piston-engine fighters and fourteen pilots aboard a Royal Navy carrier. See DHH 73/1223 File 1327, Record of Cabinet Defence Committee Decision, 92nd Meeting, 17 March 1953.

¹⁶ William T. Y'Blood, "Allied Air Forces," *Air Power History*, Vol. 47, No. 2, Summer 2000, p. 51. The existence of RCAF exchange pilots flying with USAF squadrons was acknowledged. For a detailed account of these 22 Canadian fighter pilots, see Hugh Halliday, "In Korean Skies," *Canadian Aviation Historical Society Journal*, Vol. 24, No. 4, Winter 1986.

¹⁷ Carl Mills, "Canadians in the Korean War," *Air Force Magazine*, Vol. 34, No. 4, April 2011.

independence struggles in their colonies. While the Soviet Union continued to maintain an army of 2.5 million soldiers organized into 175 divisions, by 1948, the US Army had fallen to 525,000 with only two weak divisions in Germany. Similarly, the British Army maintained only two weak divisions on the Continent. Allied air power had also been reduced to perilously low levels. The RAF in Germany (BAFO), for example, consisted of only ten squadrons equipped with 120 wartime *Spitfire*, *Tempest* and *Mosquito* aircraft with a fifty-nine per cent serviceability rate.¹⁸

The Soviet Union had established puppet Communist regimes in the countries that it had occupied in their advance against the Nazis; the Greek Civil War in 1946-47, the Communist *coup d'état* in Czechoslovakia and the Berlin blockade increased Western European fears. The existence of strong Communist parties in France and Italy added to these concerns. To deal with the potential threat, Britain, France and the Benelux countries signed the Brussels Treaty in 1948 as a fifty-year mutual defence pact. It was recognized that without the support of the United States, the defence of Western Europe could not be secured. This led to the North Atlantic Treaty that was signed on 1 April 1949.¹⁹

With the advent of the treaty, there was the assumption, noted in Chapter 1, that defence expenditures would not increase because the Alliance could deploy pooled resources more effectively, creating, in Lester Pearson's words, "a balanced collective force"²⁰ That optimistic view was demolished by the demands of the Korean War. The twelve NATO nations had spent \$20 billion on defence in 1950 and this increased to \$54 billion by 1952. In Escott Reid's

¹⁸ Bill Taylor, *Royal Air Germany since 1945*, Hinckley: Midland Publishing, 2003, p. 29.

¹⁹ The background to the establishment of NATO and Canadian efforts is well described by Escott Reid, *Time of Fear and Hope: The Making of the North Atlantic Treaty 1947-1949*, Toronto: McClelland and Stewart Limited, 1977.

²⁰ *Ibid.* p. 234

opinion, “The creation of the North Atlantic alliance did not result in rearmament. Rearmament was the result of the Korean War.”²¹

The coordination of these greatly increased national efforts to create a balanced collective force, moreover, proved to be much easier in theory than in practice. In order to achieve such a balance, it would have been necessary to unbalance national armed forces. Reid, in April 1950, noted:

...the North Atlantic alliance had “nearly all the naval forces that it is estimated would be required by 1954, whereas it only [had], in aggregate, about one-third of the air forces and one-fifth of the land forces required.” Presumably, it would have been in the interests of the alliance if countries such as the Netherlands and Canada had replaced their navies by coast guard services and put the savings into air and land forces....The North Atlantic allies did not do this. Inertia and vested interests of each of the branches of the armed forces in each of the capitals fought against it....The opportunity was lost to build a more integrated, less expensive and more efficient allied defence force.²²

When expansion of Canada’s armed forces was undertaken in 1950-51, this was exactly the conundrum that confronted the Canadian government. Although Canada had joined NATO as an ally in a military alliance, it was certainly not the intention of the Canadian government in 1949 to send troops abroad.²³ Once again, the Korean War was the catalyst for this decision.

The Defence Build Up

In the summer of 1950, the Canadian government had announced the contribution of military forces to assist in the United Nations in Korea – three RCN destroyers, RCAF No. 426 Transport Squadron and the 25th Canadian Infantry Brigade, with the Army contribution clearly

²¹ Ibid. p. 236.

²² Ibid. p. 240.

²³ The Canadian government viewed NATO as more than a military alliance, it was also intended to promote economic cooperation. See Jon B. McLin, *Canada’s Changing Defense Policy, 1957-1963*, Baltimore: Johns Hopkins Press, 1967. McLin discusses in detail the issue of Article 2 of the North Atlantic Treaty regarding economic cooperation, pp. 12-26.

representing the most substantial effort. During the fall of 1950 and the winter of 1951, contributions to the build up of NATO integrated forces in Europe became the focus with the announced contribution of a RCAF air division of eleven (later twelve) fighter squadrons and the 27th Canadian Infantry Brigade totalling over 12,000 military personnel.

The three year \$5 billion re-armament programme announced by Claxton on 5 February 1951 clearly outlined the RCAF build-up that included forty (later forty-one) regular and reserve squadrons with 3,000 aircraft, a radar system with fighters for the air defence of Canada, an air division in Europe, the establishment of a large training organization and a robust aircraft industry to manufacture aircraft for both the RCAF and other nations.²⁴ Claxton explained that

Canada's most substantial contribution to the planned force in being will be our air force participation.... Because of the large requirements of the RCAF not only in building up to its total of 40 regular and auxiliary squadrons, but also in the training services, the RCAF will, we expect, have more men than the army has today and will be spending as much as the other two services put together.²⁵

The *Globe and Mail* noted "that Canada will become the third ranking air power in the free world and probably the second ranking air training nation."²⁶ Claxton's announcement set in motion the development of the RCAF structure for the next decade that included the concept of the Big Air Force. Pronouncements regarding Canada becoming a world-class air power were not limited to Canada as evidenced by articles in the British aviation journal *Air Pictorial*.²⁷

The increased tensions in Europe prior to the outbreak of the Korean War had precipitated the development of RCAF Plan G that was originally approved by the Cabinet on 20

²⁴ CP "15-Point Arms Program," and Warren Baldwin, "Build RCAF to 40 Sqdns., 11 for Europe," *The Globe and Mail*, 6 February 1951, p. 1.

²⁵ *House of Commons Debates*, 21st Parliament, 4th Session, 5 February 1951, pp. 95-96.

²⁶ *Globe and Mail*, 6 February 1951.

²⁷ See James Hay Stevens, "Canada – One of the Greatest Centres of the Next Generation," *Air Pictorial*, Vol. XIV, No. 5, May 1952, and William Green, "Canada as an Air Power – Double Role in European and North American Defence," *Air Pictorial*, Vol. XV, No. 1, January 1953.

February 1950.²⁸ Upon the outbreak of the Korean War, further changes to Plan G were initiated with the revised version being promulgated 1 September 1950.²⁹ The intent of the revised Plan G was to build up the RCAF to a force structure of sixteen Regular squadrons at War Establishment (WE) and twelve Auxiliary squadrons at half war strength by 1 December 1953 or sooner if possible.³⁰ The revised Plan G increased the number of fighter squadrons in the Air Defence Group from three to six day fighter squadrons each with twenty-five *Sabres* and from two to three *CF-100* all-weather squadrons each with eighteen aircraft.³¹ The three additional *Sabre* squadrons were intended for overseas service. Maritime Air Group was to be increased from two to three Maritime Reconnaissance squadrons each with twelve *Lancasters*, with the third squadron being allocated to the West Coast.³² In Air Transport Command, No. 426 Squadron was increased to twelve *North Star* aircraft and No. 435 Squadron at Namao, Alberta was to be re-equipped with *C-119 Flying Boxcar* twin-engine tactical transports by 1953.³³ Training Command was to be expanded to handle the increased RCAF training load and to train 150 RAF pilots annually.³⁴ For planning purposes, the RCAF personnel establishment was revised upwards to 26,146 military and 6,541 civilian members.³⁵ The production rates were increased for *Sabre*, *CF-100*, *Lancaster* and *Harvard* aircraft.

Priorities for implementation of the revised program were assigned over a three-year period from August 1950 to December 1953.³⁶ First priority was to bring No. 426 Squadron up to War Establishment (WE) as soon as possible to support the Korean War, followed by the

²⁸ DHH 96/24, Plan "G" for the RCAF (1 September 1950).

²⁹ Ibid.

³⁰ Ibid. Section "A," Green Tab 1, p. 2.

³¹ DHH 96/24, Plan "G" for the RCAF (1 September 1950), Serial No 4 10 Aug 50 as amended by Serial No 84 (11 August 1950), p. 1.

³² Ibid. p. 2.

³³ Ibid.

³⁴ Ibid.

³⁵ Ibid. p. 3.

³⁶ Ibid. pp. 5-6.

establishment of four day fighter and two all-weather fighter squadrons that were to be operational by December 1952. The regular fighter squadrons were to be equipped and trained for rapid overseas deployment.³⁷ Two Maritime squadrons were to be operational by October 1951, provision for the training of RAF pilots was to be in ready by early 1951, and a *Mustang* fighter squadron was to be established as soon after delivery as possible of the aircraft.³⁸ For 1953, priorities were envisaged to add two day fighter and one all-weather fighter squadrons, one Maritime squadron and a *C-119* transport squadron by December 1953.³⁹

Establishment of the Air Division

Canada's overseas contribution to European based NATO air forces was originally conceived as an eleven squadron air division that was expected to consist of three squadrons with a total of seventy-five aircraft in the interceptor day fighter role, seven squadrons with a total of 112 aircraft in the fighter-bomber role and one squadron with sixteen aircraft in the fighter-reconnaissance role.⁴⁰ This was subsequently changed to a twelve squadron air division to consist of 203 and eventually 300 interceptor day fighters.⁴¹

To assist with this build-up and gain operational flying experience, the Canadian government deployed No. 421 Squadron in January 1951 to the UK equipped with sixteen RAF *Vampire F.B. Mk.5* jet fighters and two *Meteor T. Mk.7* jet trainers, with the intention that this

³⁷ Ibid. p. 6.

³⁸ Ibid. pp. 5-6.

³⁹ Ibid. pp. 5-6.

⁴⁰ DHH 73/1223, Series 3, Sub-series 14, File 2000-2001, Minutes of a Conference of Air Officers Commanding and Group Commanders, 6-7 December 1950, p.6) see also DHH 73/1223, Series 3, Sub-series 2, Cabinet Defence Committee, "Cabinet Conclusions of February 1st, 1951 – North Atlantic Medium Term Defence Plans: Commitments."

⁴¹ DHH 73/1223, Series 3, Sub-series 14, Box 102, File 2000-2001, Minutes of a Conference of Air Officers' Commanding and Group Commanders, 17-18 January 1952, p. 7. "The AMCJS [Air Member Canadian Joint Staff] London (Air Commodore Costello) wondered whether it was likely that our F86s would be pressed into a tactical role in Europe. The CAS (Air Marshal Curtis) stated that this was very unlikely as the RCAF contribution represented the only major interceptor force in Europe today and in all likelihood would remain so."

would ultimately develop into a wing of three *Sabre* squadrons.⁴² No. 421 Squadron conducted operations from RAF Odiham under the operational control of RAF Fighter Command until October 1951, returning to Canada in December to be re-equipped with the *Sabre* and returning to Grostenquin, France as part of No. 2 (Fighter) Wing in October 1952.

The deployment of No. 1 (Fighter) Wing with three Canadair *Sabre Mk. 2* equipped squadrons to North Luffenham, England commenced in November 1951 where it remained until 1955 under the operational control of RAF Fighter Command. This marked the beginning of the build up of the Air Division and a significant RCAF contribution to the defence of Western Europe.⁴³ The remaining three Wings destined for No. 1 Air Division were formed in Canada and then shipped overseas to France and West Germany during 1952-53, with the Air Division being completely deployed on the continent by 1955 with the re-location of No. 1 (Fighter) Wing to Marville, France.⁴⁴

NATO air power as part of the integrated force in the Central Region was grouped into Allied Air Forces Central Europe (AAFCE) that was established at Fontainebleau, France on 2 April 1951.⁴⁵ AAFCE was subordinate to Allied Forces Central Europe (AFCENT) also at Fontainebleau, which in turn was subordinate to Allied Command Europe (ACE). The role of AAFCE was to provide command and control for NATO air assets in the Central Region, organized into two air forces, the 2nd Allied Tactical Air Force (2ATAF) under British command,

⁴² See Minutes of 118th Meeting of Air Members, 6 October 1950. Initial discussions on the possibility of a RCAF fighter squadron deployed overseas had commenced in 1949. See Carl Christie, "Swords for Peace: RCAF Sabres with RAF Fighter Command," in W.A. March, ed., *Sic Itur Ad Astra: Canadian Aerospace Power Studies, Volume 3, Combat if Necessary, But Not Necessarily Combat*, Department of National Defence: Canadian Forces Aerospace Warfare Centre, Trenton, Ontario, 2011.

⁴³ Ibid. See also *1 Fighter Wing: The First Year 1951-52, RCAF North Luffenham, Rutland, England, 1952*.

⁴⁴ See Ross Wilmot, "The RCAF in SACEUR," *Canadian Aviation*, Vol. 26, No. 6, June 1953.

⁴⁵ See W.T. Gunston, "AAFCE – Part 1: The Background to NATO and its Constituent Formations," *Flight*, No. 2318, Vol. LXIII, 26 June 1953, and "AAFCE – Part 2: The Present Allied Command," *Flight*, No. 2327, Vol. LXIV, 28 August 1953.

consisting of British, Belgian and Dutch air forces, and the 4th Allied Tactical Air Force (ATAF) under US command that consisted of American, French and Canadian air forces. 4ATAF consisted of the US 12th Air Force, a formation in USAFE, the *1er Division Aérienne* of the *Armée de l’Air* and the RCAF’s No. 1 Air Division. The ATAFs were assigned to support each of the Army Groups in the Central Region with 2ATAF in support to Northern Army Group (NORTHAG), and 4ATAF responsible to support the Central Army Group (CENTAG). As part of 4ATAF, No. 1 Air Division was to be stationed at four airfields in eastern France and West Germany.

The initial establishment of 4ATAF Headquarters as a double hatting of the USAFE 12th Air Force caused some concerns about the Canadian air division’s participation in planning and decision-making. The development of an integrated NATO headquarters rather than employing a national Headquarters (i.e. a USAFE formation Headquarters) would have been preferable, but this issue was ultimately resolved.⁴⁶ Another contentious command and control issue was the potential break up of the Air Division to fight as individual squadrons and wings rather than as a complete formation. For example, AAFCE planning staff had tentatively earmarked some RCAF squadrons to deploy to Norway in the event of war based on Canadian experience in Northern flying conditions.⁴⁷ This proposal was shelved, but illustrated the need for Canadian

⁴⁶ DHH 73/1223, Box 36, File 640, Letter from General Charles Foulkes, Chairman, Chiefs of Staff Committee to General Alfred M. Gruenther, Supreme Commander, Allied Powers Europe, 1 March 1954. In this letter, Foulkes refers to the need to train RCAF officers as they had very little experience at an operational headquarters, an activity that did not occur during the Second World War as “...the RAF used the RCAF as fillers and this did not give them an opportunity to develop staff officers and commanders.”

⁴⁷ See DHH 73/1223, Series 3, File 1306, Chiefs of Staff Committee, Minutes of the 493rd Meeting of the Chiefs of Staff Committee, 10 May 1951.

vigilance to ensure that the Air Division operated as an operational entity rather than being broken up into smaller tactical contributions.⁴⁸

Interestingly, the concurrent dispatch of the RCAF Air Division and the Army Brigade to Europe for NATO defence showed evidence of the recent historical sensitivities and cultural baggage of the two services.⁴⁹ The large Army created during the Second World War generally had a “good war,” particularly with the creation of the First Canadian Army which had provided that service with a considerable degree of autonomy. Therefore, in the case of the Canadian NATO brigade, service under the command of the British Army of the Rhine (BAOR) as part of NORTHAG did not present grounds for angst among the soldiers.⁵⁰ By contrast, the RCAF’s Second World War overseas experience wherein over fifty percent of RCAF aircrew served as individuals in RAF units despite the government’s long struggle with the British to form RCAF squadrons and higher level formations in accordance with the Article XV of the British Commonwealth Air Training Plan agreement had been the cause of considerable frustration for Canadian airmen. There was no burning desire for the RCAF to once more serve under the command of the RAF. In addition, there was the argument that the RCAF was flying the same aircraft as USAFE with attendant requirements for similar supply, maintenance and flying procedures. The Canadian NATO brigade received its air support from 2ATAF until 1970 when the Canadian land and air formations were amalgamated into Canadian Forces Europe.

⁴⁸ DHH 73/1223, File 2001, 1 Air Division Précis for AOCs Conference, 14-17 January 1957, Future Role, p. 16. This issue regarding the split use of the Air Division remained a sensitive one, and arose again during the late 1950s when an integrated European air defence system was being developed.

⁴⁹ See DHH 73/1223, Series 3, File 1306, Chiefs of Staff Committee, Minutes of the 503rd Meeting, 14 August 1951, Item II, Grouping of Canadian Forces in Europe. See Air Commodore K.L.B. Hodson, *The RCAF Air Division in Europe*, Address to the United Services Institute, London, Ontario, 15 December 1954, p. 3.

⁵⁰ See Stephen J. Harris, “The Post-War Army in Canada and NATO,” in John Martenson et al, *We Stand on Guard: An Illustrated History of the Canadian Army*, Montreal: Ovale Publications, 1992.

The *Sabre Mk.2* fighters that initially equipped the Air Division were more modern than the contemporary aircraft that equipped the other NATO air forces. The Air Division began the migration to the continent in 1952 with the establishment of No. 2 (Fighter) Wing at Grostenquin, France with the build up to twelve squadrons organized into four wings comprising 300 *Sabre* fighters completed by 1953. In addition to the four airfields, the Air Division maintained a Headquarters at Metz, France and a logistics base at Langar, England. Additional flying units consisted of a transport flight with Bristol *Freighter* cargo aircraft and a communications flight with *Dakota* transport aircraft. In addition to the Unit Establishment of twenty-five *Sabre* fighters per squadron, each squadron was equipped with two *T-33* jet trainers. At full strength, the Air Division numbered over 6,000 personnel.⁵¹ In terms of personnel, though this may have represented only twelve per cent of the total Regular RCAF personnel, the Air Division with its twelve fighter squadrons, included the majority of the twenty-one Regular fighter squadrons. Apart from the requirement to recruit and train the required air and ground crews and build hundreds of *Sabre* fighters, there was also the requirement to completely build the four airfields and their associated infrastructure. This large contribution of funding required to develop this infrastructure is often omitted when examining the Canadian contribution to NATO.

The air assets assigned to AAFCE were expected to perform the following roles: day and all-weather air defence and air superiority, close air support and air interdiction and tactical reconnaissance. During the 1950s, there were considerable differences among the various

⁵¹ See Air Commodore K.L.B. Hodson, *The RCAF Air Division in Europe*. Address to the United Services Institute, London, Ontario, 15 December 1954 and Hamilton District Officers Institute, 3 November 1955. Hodson provides a good description of the Air Division's development. See also "Sabre Power for NATO," *Canadian Aviation*, Vol. 29, No. 2, February 1956, pp. 48-49.

NATO assigned air forces regarding both the quantity and quality of these contributions.⁵² The qualitative and quantitative variances among the various air forces of the Central Region (excluding the USAFE) between 1950 and 1955 are highlighted at **Table 4-1** and **Table 4-2** below. In 1950, the use of Second World War vintage piston-engine fighters was still widespread, along with the introduction of a limited number of first generation jet fighters such as the British *Vampire* and *Meteor*. Within five years as a result of the NATO military build up, the older aircraft had all but disappeared from front line service to be replaced with modern British and, more frequently, modern US combat aircraft. For France, modern domestically developed and produced aircraft (i.e. Dassault Aviation) replaced its earlier reliance on older British and American aircraft. This situation was still very dynamic, as within the next five years –by 1960 – modern aircraft once again replaced older models as will be discussed in Chapter 6. In addition, the *Luftwaffe*, non-existent in 1955, had emerged by 1960 as a major air arm for NATO forces in the Central Region. Issues such as advancing technology, changing strategy, and evolving force structures were all factors that were to have an impact on the future of the Air Division.

The Air Division had begun to exchange its *Sabre Mk.2* fighters for the improved *Sabre Mk.5* in 1954, but this programme was short lived with the introduction of the more advanced *Sabre Mk.6* aircraft in 1955. The Air Division reached the peak of its capabilities with this version of the aircraft, though the 1956-1957 replacement of four *Sabre* squadrons by a similar number of *CF-100* all-weather squadrons represented an improvement of the Air Division's total

⁵² See Christopher J. Bowie, Mark Lorell and John Lund, *Trends in NATO Central Region Tactical Fighter Inventories: 1950-2005*, RAND Note N-3053-AF, Santa Monica: The RAND Corporation, May 1990.

air defence capabilities.⁵³ Originally, it had been intended to replace all the *Sabre* squadrons with *CF-100* aircraft, but this became unaffordable.⁵⁴

Table 4-1 - NATO Central Region Airpower 1950			
Source: Trends in NATO Central Region Tactical Fighter Inventories 1950-2005, RAND Note N-3053-AF			
Country	No. of Sqns	Aircraft	Role⁵⁵
Belgium	5	<i>Spitfire</i>	IDF
	2	<i>Mosquito</i>	AWX
	1	<i>NF.30</i>	IDF
		<i>Meteor F.4</i>	
Canada	0	-	
Denmark	1	<i>Meteor F.4</i>	IDF
	1	<i>Spitfire</i>	IDF
France	7	<i>Vampire</i>	IDF
	7	<i>P-47</i>	GA
	3	<i>Thunderbolt</i>	Recce
		<i>P-38</i> <i>Lightning</i>	
Netherlands	5	<i>Meteor F.4</i>	IDF
	1	<i>Spitfire</i>	IDF
Great Britain	9	<i>Vampire</i>	IDF
	2	<i>FB.5</i>	GA
	1	<i>Mosquito</i>	Recce
		<i>B.35</i> <i>Meteor FR.9</i>	

⁵³ Victor Koby, "CF-100s in New NATO Strategy," *Canadian Aviation*, Vol. 30, No. 2 February 1957.

⁵⁴ DHH 73/1223, Series 3, File 1306, Chiefs of Staff Committee, Minutes of 482nd Meeting, 16 January 1951, pp. 4-5.

⁵⁵ IDF – Interceptor Day Fighter, AWX – All Weather Fighter, GA – Ground Attack, Recce – Reconnaissance.

Table 4-2 - NATO Central Region Airpower 1955

Source: Trends in NATO Central Region Tactical Fighter Inventories 1950-2005, RAND Note N-3053-AF

Country	No. of Sqns	Aircraft	Role
Belgium	3	<i>F-84E/G</i>	IDF/GA
	6	<i>F-84G</i>	IDF/GA
	10	<i>Meteor F.8</i>	IDF
	2	<i>Mosquito</i> <i>NF.30</i>	AWX
Canada	12	<i>Sabre</i>	IDF
Denmark	1	<i>Meteor</i>	AWX
	1	<i>NF.11</i>	IDF
	2	<i>Hunter F.4</i>	IDF
	2	<i>F-84G</i>	GA
	1	<i>F-84G</i> <i>RF-84G</i>	Recce
France	6	<i>F-84F</i>	GA
	6	<i>Ouragan</i>	IDF/GA
	2	<i>Vampire</i>	IDF
	5	<i>F-84G</i>	GA
	3	<i>Mystere IIC</i>	IDF
	3	<i>Mystere IVA</i>	GA
	3	<i>Meteor</i>	AWX
	3	<i>NF.11</i> <i>RF-84F</i>	Recce
Netherlands	9	<i>Meteor F.8</i>	IDF
	4	<i>F-84F</i>	GA
		<i>RF-84F</i>	Recce
Great Britain	6	<i>Sabre F.4</i>	IDF
	5	<i>Hunter F.4</i>	IDF
	5	<i>Venom FB.1</i>	IDF/GA
	2	<i>Venom FB.4</i>	IDF
	3	<i>Meteor</i>	AWX
	5	<i>NF.11</i>	GA
	1	<i>Canberra</i>	Recce
	3	<i>B.2</i>	Recce
	2	<i>Canberra</i>	Recce
	1	<i>PR.3</i>	Recce
		<i>Canberra</i> <i>PR.7</i> <i>Meteor FR.9</i> <i>Meteor</i>	

		PR.10	
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To fully appreciate the impact of the Air Division to Western European defence, it is necessary to review the comparative strengths of other NATO air forces at this time.⁵⁶ AAFCE in the Central Region at

this time comprised less than 1,000 aircraft in total between the two ATAFs. A considerable portion of the British and French air forces, plus elements of the Dutch and Belgian air forces, were involved in operations in their declining empires. This obviously limited their ability to reinforce the NATO Central Region. The Royal Netherlands Air Force, for example, obtained its first jet fighters in 1948, consisting of thirty-eight British *Meteor* fighters. Additional aircraft were obtained from Britain and, in 1951, licensed production of the aircraft was undertaken, but a serious air force build up did not begin until 1953. The Belgian Air Force established its first squadron of nineteen *Meteor* jet fighters in 1949 and licensed production was undertaken, though piston-engine *Spitfire* fighters remained in service until 1951. Other NATO air forces, outside the Central Region, were also small and poorly equipped. The Royal Norwegian Air Force had formed a squadron of twenty-nine *Vampire* jet fighters by the time this nation had joined NATO

⁵⁶ There are few studies on comparative NATO air power. Despite its publication date (1958), one of the best references remains William Green and John Fricker, *The Air Forces of the World: Their History, Development and Present Strength*, London: Macdonald & Co (Publishers) Ltd. For a study of USAFE, see Eduard Mark, *Defending the West: The United States Air Force and European Security 1946-1998*, USAF History Office, Cees Steijger, *A History of USAFE*, Airlife Publishing, and Robert Jackson, *Strike Force: The USAF in Britain since 1948*, London: Robson Books Ltd, 1986. For an examination of RAF Germany, see Bill Taylor, *Royal Air Force Germany since 1945*, Hinckley, England: Midland Publishing, 2003, and the *Royal Air Force in Germany 1945-1993*, The Royal Air Force Historical Society Seminar, 9 December 1998. For the *Luftwaffe*, see James S. Corum, "Building a New Luftwaffe: The United States Air Force and Bundeswehr Planning for Rearmament, 1950-1960," *The Journal of Strategic Studies*, Vol. 27, No. 1, March 2004, James S. Corum, "Starting from Scratch: Establishing the Bundesluftwaffe as a Modern Air Force, 1955-1960," *Air Power History*, Vol. 50, No. 2, Summer 2003, and Stuart Peach, "The Fall and Rise of the Luftwaffe," *RAF Air Power Review*, Vol. 10, No. 2 Summer 2007. For the smaller NATO air forces, see William Green, "Dutch Fortify Defenses in the Air," *Canadian Aviation*, Vol. 20, No. 7, July 1949, William Green, "Small Danish Air Force Accents Training Effort Planning Jet Squadrons," *Canadian Aviation*, Vol. 24, No. 2 February 1951, and Øistein Espenes and Nils E. Naastad, "The Royal Norwegian Air Force: A Multi-Purpose Tool during the Cold War," *Air Power History*, Vol. 47, No. 1, Spring 2000.

in 1949 whilst the Royal Danish Air Force formed its first squadron of twenty-three *Meteor* jet fighters that same year. The higher priority within national budgets for the re-equipment and build up of these NATO air forces may have been hindered as these services had only recently become independent air forces; thus they lacked the influence within government enjoyed by the RCAF.

In Canada, the major effort in the massive three-year \$5 billion build up of the armed forces was directed towards the expansion of the RCAF and the production of associated aircraft. The period of the 1950s has been referred to as the Golden Age of the RCAF and indeed this initially appeared to be the case at the time. Eayrs described the immediate post-war years of the RCAF:

Spirits were highest in the Air Force, and rose with the passing of the years. Since 1946, the RCAF, capitalizing upon (but not capitulating to) doctrines of air power sedulously propagated in the United States, had been able consistently to attract the largest share of recruits. Since 1947, it had been able to secure the largest share of budgets.⁵⁷

The enormous challenges associated with the recruiting, training, organizing and equipping the Air Division's 6,000 officers and airmen (including 500 *Sabre* fighter pilots) along with their twelve squadrons of 300 *Sabre* jet fighters and their sustainment has generally not been given the attention that it deserves. The establishment of the RCAF Air Division is particularly significant when considering the small size of the RCAF in comparison to the USAF and RAF. USAF jet fighter strength in Korea in July 1953 was 297 *Sabre* and 218 *F-84 Thunderjet* aircraft.⁵⁸ USAFE meanwhile expanded from 371 aircraft in four wings (*F-47 Thunderbolt* piston-engine and *F-80* jet fighters) in 1950 to 2,100 aircraft in sixteen wings, mostly *Sabre* and *F-84* aircraft, by 1954.⁵⁹

⁵⁷ Eayrs, *In Defence of Canada – Volume 3*, p. 122.

⁵⁸ Ray Wagner, *The North American Sabre*, London: Macdonald & Co (Publishers) Ltd, 1963, p. 76.

⁵⁹ Mark, *Defending the West*, p. 36. By December 1956, all USAFE fighter-bombers were capable of carrying nuclear weapons.

The RAF's 2nd Tactical Air Force in Germany at this time consisted of over 500 aircraft, but they were mostly *Vampire*, *Venom* and *Meteor* fighters, with only ten squadrons equipped with the modern Canadair *Sabre Mk.4*.⁶⁰ For a short period of time, No. 1 Air Division was second to USAFE in the availability of a large number of modern advanced jet fighters in NATO Europe. Despite the implementation of this Big Air Force concept, there were plans to develop an even larger organization.

“Closing the Gap” and the 1952 Lisbon Conference

An important political and military factor was that with a small population of fourteen million Canada was not able to maintain a large army. A large air force provided an alternative manner in which to raise substantial and effective armed forces in peace-time and at the same time had greater appeal to the public because of the glamour of aviation, and the promise of the opportunity to learn technical skills. The political advantage in maintaining a large air force was to counter any possibility of conscription, long a divisive issue.⁶¹ Despite the bitter discord in the two World Wars, proposals for conscription arose with the demand for Canadian troops in Korea.⁶² Though conscription proposals came primarily from the Chief of the General Staff and retired generals, the RCAF Association at their annual convention in 1951 also called for

⁶⁰ Taylor, pp. 62 and 70.

⁶¹ Eayrs, *In Defence of Canada – Volume 3*. Original post-war planning for the Canadian Army had been based on a regular force of 55,788 and a militia of 177,396 to be raised through universal military training, p. 79. See J.L. Granatstein and J.M. Hitsman, in *Broken Promises: A History of Conscription in Canada*, Toronto: Oxford University Press, 1977. They discuss the Cold War experience with proposals for conscription in Canada.

⁶² The issue of conscription arose shortly after the outbreak of the Korean War and prior to the dispatch of Canadian troops to Korea. See Colonel Wallace Goforth, “Now: A Real Defence,” *Saturday Night*, Volume 65, Number 46, 22 August 1950 and Michael Barkway, “How Much Manpower for Defence?” *Saturday Night*, Volume 65, Number 47, 29 August 1950. Just prior to the 5 February 1951 defence programme announcement, the issue of conscription arose again, Warren Baldwin, “PM Says Mind Open About Conscription,” *The Globe and Mail*, 2 February 1951, p.2. The potential massive need for Army manpower also arose during the “closing the gap” deliberations with the Army’s proposals for a one or two division contribution to European based forces that could not have realistically been maintained without resorting to conscription. See DHH 73/1223 Series 1, Box 13, File 265, Consideration of MRC 5/2 and Canadian Proposals to Close the Gap, 10 September 1951. In retirement, Lieutenant-General Simonds continued to argue for conscription.

conscription.⁶³ For the RCAF, however, conscription was not an acceptable or desirable approach to staff the air force.⁶⁴ Maintenance of this large air force on a purely volunteer basis saved the government from having to deal with the unpopular topic of conscription. It also resulted in the recruitment of women into the post-war RCAF.⁶⁵

The offensive capabilities of the home-based RCAF were relegated to the two Auxiliary squadrons equipped with the piston-engine *Mitchell* of Second World War vintage, but the adoption of tactical bombers by the RCAF continued to be an active issue throughout 1951. In this case, however, the issue was based on the proposed creation of a second RCAF air division in Europe equipped with twelve squadrons of tactical jet bombers.⁶⁶

The acquisition of the light bomber air division was part of the larger issue of “closing the gap” in the deficiency of air power within SHAPE. Given the Soviet land forces’ overwhelming dominance in Europe, NATO viewed the development of robust air power as a key element needed to repel a possible Soviet invasion. Soviet air forces were assessed at 4,400 aircraft with 1,300 aircraft in reserve “to support the land campaign against Western Europe and

⁶³ See General H.D.G. Crerar, “The Case for Conscription,” *Queen’s Quarterly*, Vol. LVIII, Winter 1951-52, and “General Crerar’s Warning,” *Saturday Night*, Volume 66, Number 24, 20 March 1951. See also “R.C.A.F. Association – Second National Convention, 25-26 May 1951,” *The Roundel*, Volume 3, Number 8, July-August 1951, pp. 54-55.

⁶⁴ DHH 73/1223 Series 3 Sub-series 13, Minutes of the 142nd Meeting of Air Members, 5 December 1951, p. 1.

⁶⁵ See Patricia A. Power, *With Their Feet on the Ground: Women’s Lives and Work in the Royal Canadian Air Force, 1951-1966*, Unpublished MA Thesis, Ottawa: University of Ottawa, September 1998.

⁶⁶ The issue of a significant increase to the RCAF contribution to European based forces is raised by Eayrs in his *In Defence of Canada- Volume 4*, p. 223. However, Eayrs relied on Claxton’s memoirs that referred to “an additional bomber wing,” and though it is noted that the Canadian contribution would have been “something close to one thousand aircraft,” it is never satisfactorily explained. Roy Rempel in *Counterweights: The Failure of Canada’s German and European Policy, 1955-1995*, Montreal and Kingston: McGill-Queen’s University Press, 1996, was the first person to address the magnitude of the proposed second air division. Rempel notes, “The plan for the RCAF... would have involved a build-up to an overall strength of some 1400 jet combat aircraft. This would have included adding a second Canadian air division of light jet bombers.... In total, a possible build-up in Europe to nearly 500 jet fighters and bombers was envisaged.” p. 111.

to take part in the initial air attack against the United Kingdom.⁶⁷ In comparison, it was assessed that NATO might possess a minimum of 1,200 aircraft by 1952; a number that excluded USAFE and the UK based Fighter Command.⁶⁸

The weak position of air power on the continent reinforced the critical importance of a Canadian air contribution to the collective defence of Western Europe. Plans to address these deficiencies were contained in the “Report on Study by the U.S., U.K, French and Canadian Chiefs of Air Staff on the Gap in SHAPE Air Power.”⁶⁹ The endorsement of this report would have had enormous implications for both the RCAF and the Canadian defence budget.⁷⁰ The proposed RCAF commitment would have consisted of a total of twenty-five squadrons stationed in Western Europe, including the eleven fighter squadrons that had already been committed in February 1951. Apart from the twelve bomber squadrons, the expansion would have necessitated an additional fighter squadron and a long-range transport squadron.⁷¹ These expanded operational forces would also require two additional Basic Flying Training Schools, one Advanced Flying Training School, and a light bomber Operational Training Unit. Manpower requirements totalled 14,120 that would bring the RCAF establishment to 58,320 compared to the currently authorized 44,200, with an increase in the RCAF overseas strength from 5,678 to 13,316 personnel.⁷² The aircraft requirements consisted of 790 *Sabre* fighter and 364 light bomber aircraft that included the equipment of the two air divisions, reserves,

⁶⁷ PRO, DEFE 5/31 Chiefs of Staff Committee (UK), C.O.S. (51) 322, 31 May 1951, “Defence of Europe in the Short Term,” p. 3, accessed through the Parallel History Project on NATO and the Warsaw Pact, http://www.isn.ethz.ch/php/collections/coll_7.htm date accessed, 26 January 2006.

⁶⁸ Ibid. p. 3.

⁶⁹ DHH 73/1223, Series 3, File 1306, Chiefs of Staff Committee, Minutes of the 496th Meeting, 23 May 1951, pp. 3-4.

⁷⁰ See DHH 73/1223, Series 3, Sub-series 2, Cabinet Defence Committee, “Preliminary Proposals for Filling the Gap in NATO Air Forces in Europe,” 14 June 1951.

⁷¹ DHH 73/1223, Series 1, File 265, “The Air Implications of MRC 5/2” (SG20/31), 10 September 1951.

⁷² Ibid. pp. 1-2. Also DHH 73/1223 Series 3, File 1306, Chiefs of Staff Committee, Minutes of the 498th Meeting, 25 June 1951, p. 5.

Operational Training Unit requirements, pipeline and wastage. Additional requirements consisted of sixteen long-range transport aircraft along with 400 *Harvard* and 217 *T-33* trainer aircraft to meet the increased training demands. The implementation of this programme would have required an additional \$733 million over a three-year period from FY 1952/53 to FY 1954/55.⁷³ However, even before the issue had been discussed at the 23 May 1951 Chiefs of Staff Committee Meeting, Air Marshal Curtis had expressed the view that “the RCAF should not enter the light bomber field unless it was absolutely essential.”⁷⁴

The issue of “closing the gap” in European based air power was to occupy the attention of the Air Staff for some time, culminating in the Lisbon Conference of February 1952. The operational requirements for the additional air assets were refined to consist of a fighter division of twelve squadrons each of twenty-five aircraft and a light bomber division of twelve squadrons with 192 aircraft. The long-range transport squadron to support the enlarged overseas force was to consist of twelve transport aircraft. To meet the light bomber requirements, 385 *Canberra* aircraft were needed up to FY 1954/55 with an additional unfunded requirement for 192 *Canberra* aircraft for War Reserve after FY 1954/55. Despite the recently announced three-year \$5 billion defence plan, by the spring of 1951 there was a squeeze on future defence expenditures, so the negative reaction of Claxton to these proposals of the “Paris Plan” should not appear surprising:

Our Air Force, though not our government, had been represented in these discussions and I believe took an active part in them. They resulted in allotting to Canada an additional bomber wing [sic], which would have brought our contribution to NATO to something close to one thousand aircraft, or more than the number to be contributed by either the United States or Britain. Nothing but the unbridled enthusiasm of our airmen could have produced such a result. I was exceedingly annoyed when I heard about it and made our

⁷³ DHH 73/1223, Series 3, File 1306, Chiefs of Staff Committee, Minutes of the 496th Meeting, 23 May 1951, pp. 3-4.

⁷⁴ DHH 73/1223 Series 3, Sub-series 13, Minutes of the 129th Meeting of the Air Members, 9 May 1951, p. 3.

Air Force go right back to the Paris group and say they had acted entirely without instruction and we would not be adding any aircraft whatever.⁷⁵

However, Claxton was wrong to ascribe this view of events as an attempt by the Chiefs of Air Staff to undertake an end run around the NATO Military Committee.

The “Paris Plan” had been discussed in great detail at the Chiefs of Staff Committee Meeting on 25 June 1951, and though there were no visible showstoppers, a decision to endorse the proposal was deferred pending a review of the impact on army and navy requirements.⁷⁶ The comments by General Charles Foulkes, the Chairman, Chiefs of Staff Committee, at the NATO Military Representatives’ meeting on 11 October 1951, clearly stated the Canadian viewpoint regarding the additional RCAF commitments, noting that “the magnitude of this commitment appears to us to be almost staggering and beyond what can be efficiently obtained.”⁷⁷ Foulkes explained that aircraft production bottlenecks, the existing commitment of eleven squadrons to the Integrated Force and the nineteen squadrons required for Canadian air defence, plus the 394 *Sabre* aircraft to be supplied to the RAF, the doubling in size of the RCAF in two years, and the increased training requirements were factors that were fully taxing Canadian air power capabilities.

Foulkes softened his remarks by noting that it might be possible to increase the fighter contribution from 203 aircraft in eleven squadrons to 300 aircraft in twelve squadrons. However, he was adamant that the light bomber division could not be considered. The production of *Canberra* aircraft in Canada or their availability from elsewhere was not considered viable and the training of the additional personnel was not considered achievable. Despite the personal plea

⁷⁵ Eayrs, *In Defence of Canada – Volume 4*, p. 223. See also Andrew M. Johnston, *Hegemony and Culture in the Origins of NATO Nuclear First-Use, 1945-1955*, New York: Palgrave Macmillan, 2005, p. 112.

⁷⁶ DHH 73/1223, Series 3, File 1306, Chiefs of Staff Committee, Minutes of the 498th Meeting, 25 June 1951, p. 2.

⁷⁷ DHH 73/1223, Series 1, File 265, “Closing the Gap: Canadian Appreciation,” 1 October 1951, p. 7.

from SACEUR, General Eisenhower, who considered the US, the UK and Canada, as the only NATO nations capable of building up their air power, this massive enlargement of the RCAF did not proceed.⁷⁸ In the end, the Canadian air division commitment was increased to the twelve squadrons with 300 *Sabre* fighters with a phased build up of the Air Division to have ninety-six aircraft available to SACEUR by December 1952, 219 aircraft by September 1953, 273 aircraft by 1 July 1954 and 300 aircraft by December 1954.⁷⁹

Closing the gap in air power remained a critical objective, and notwithstanding the Canadian view of the “Paris Plan,” the North Atlantic Council at the Lisbon conference in February 1952 established force goals for 4,067 combat aircraft by 31 December 1952, 6,500 aircraft by December 1953 and 9,000 aircraft by December 1954.⁸⁰ R.N. Rosecrance suggested that the promotion of these force structure levels reflected a “conventional WWII strategy” and did not take into account the USAF Strategic Air Command or tactical nuclear weapons.⁸¹ In any event, these targets had no reasonable chance of being achieved as Canadian analysis indicated that 5,870 would be the maximum number of NATO aircraft by 1955, a number that did not account for the quality of aircraft.⁸² An additional study in 1954 of the air situation, “SHAPE Study on Air Defence in the NATO Area of Europe” noted that there was “virtually no air defence at this time.”⁸³ Interestingly, despite the weakness of air defences, the RCAF had been requested to stockpile bombs and rockets so that the Air Division could operate in the ground

⁷⁸ DHH 73/1223, Series 3, File 1306, Chiefs of Staff Committee, Minutes of the 498th Meeting, 25 June 1951, p. 2.

⁷⁹ DHH 73/21223, Series 3, File 1806, Chiefs of Staff Committee, Minutes of the 509th Meeting, 18 October 1951, p. 3.

⁸⁰ M.J. Armitage and R.A. Mason, *Air Power in the Nuclear Age*, (Second Edition), Chicago: University of Illinois Press, 1985, p.187. See also John S. Duffield, *Power Rules: The Evolution of NATO's Conventional Force Structure*, Stanford, CA: Stanford University Press, 1995, Chapter 2.

⁸¹ R.N. Rosecrance, *Defense of the Realm: British Strategy in the Nuclear Epoch*, New York: Columbia University Press, 1968, p. 132.

⁸² DHH 73/1223, Series 1, File 132, “NATO National Production of Fighter Aircraft,” SO/Log Joint Staff, 7 April 1954.

⁸³ DHH 73/1223, Series 1, Box 147, File 9, CC 1084-1 (JPS) 15 November 1954, “Brief on SHAPE Study on Air Defence in the NATO Area of Europe,” p.1.

attack role.⁸⁴ The air staff declined the request because the Air Division had enough to do in carrying out the air superiority role. SACEUR had requested that Canada provide an additional fighter wing equipped with all-weather fighters, and in 1954 the air staff decided to re-equip one squadron in each of the four wings with all-weather *CF-100* aircraft with this task being completed by 1957.⁸⁵ Canada was one of the few nations in a position to improve the air power situation in Western Europe, and the introduction of the *CF-100* into the Air Division significantly increased its air defence capability.⁸⁶

Air Power and the Transformation of NATO Strategy

Throughout the period, NATO air forces had to consider the conduct of air operations within the context of nuclear weapons.⁸⁷ At first, it was a matter of conducting air operations under the umbrella of the USAF Strategic Air Command as the sole possessor of nuclear weapons. With the Soviet explosion of its first nuclear device in August 1949, NATO air forces now had to contend with the Soviet nuclear threat. Initial NATO planning proposals to deal with the Soviet conventional threat had been based on the build up of massive conventional forces of ninety-six army divisions supported by 9,000 aircraft. This was the essence of the force proposals at the February 1952 Lisbon Conference discussed under the auspices of “closing the

⁸⁴ The issue of stockpiling rockets and bombs for use by the Air Division in a tactical support role continued to be an issue. See DHH 73/1223, Series 3, Sub-series 13, 200th Meeting of the Air Members, 20 July 1954, p. 3.

⁸⁵ DHH 73/1223, Series 3, Sub-series 13, Minutes of the 206th Meeting of the Air Members, 26 November 1954, Substitution of CF-100 Aircraft for some F86 Aircraft in 1 Air Division – Europe.

⁸⁶ DHH 73/1223, Series 1, File 132, “Record of Conversation held with Air Chief Marshal Sir Basil Embry by General Foulkes and AVM Smith, 25 October 1954,” p.2. ACM Embry was Commander-in-Chief, Allied Air Forces Central Europe. See also DHH 73/1223, Series 1, File 132, TS1015-6-4/1-54, “Memorandum for the Cabinet Defence Committee – Substitution of Four CF-100 Squadrons for Four F86 Squadrons in RCAF Air Division Europe,” 7 December 1954. Despite its superiority in the all-weather interceptor role, the 53 *CF-100s* sold to the Belgian Air Force represented its only export order. See Victor Koby, “CF-100 Flies into Export Fields,” *Canadian Aviation*, Vol. 28, No. 10, October 1955, p. 29.

⁸⁷ See Wing Commander M. Blake, “Ground Defence in the RCAF,” *The Roundel*, Vol. 4, No. 11, December 1952, and Directorate of Ground Defence, “Ground Defence in the RCAF,” *The Roundel*, Vol. 6, No. 9, October 1954.

gap.” It soon became apparent that the NATO nations had neither the political, economic, or military wherewithal to raise and maintain such massive forces in peacetime. Despite the inability of NATO to realize the Lisbon force goals, NATO strategic guidance in the immediate aftermath of the Lisbon Conference adhered to the massive expansion of conventional forces:

It has been assessed by sources with knowledge of weapons of mass destruction that, although by the period 1953-1954 their effect on the conduct of war will not dictate a need to reduce current NATO force goals, greater availability of such weapons and increased delivery capability during the period 1954-1956 may then necessitate re-evaluation of the requirements for a successful defence of the NATO area. However, as the conventional NATO forces at present in being fall far short of requirements, no relaxation can be allowed in their planned expansion until the development of weapons justifies a reassessment....⁸⁸

Despite public pronouncements on the build up of conventional forces, ongoing studies examined the utility of introducing battlefield nuclear weapons for the defence of Europe as early as 1952.⁸⁹ Starting in the mid-1950s and continuing into the 1960s, NATO strategic planning and the associated force structure proposals were based on much smaller conventional forces supported by nuclear weapons, including battlefield tactical nuclear weapons developed as a result of miniaturization. NATO strategic planning and its emphasis on nuclear weapons was also undoubtedly assisted by the national strategies of the largest members that emphasized nuclear equipped forces – the US in its adoption of Massive Retaliation in 1953 with the election of the Eisenhower administration, and the British 1952 *Global Strategy Paper* issued by Churchill’s government.

⁸⁸ MC 14/1 (Final) 9 December 1952, “North Atlantic Military Committee Decision on MC 14/1: A Report by the Standing Group on Strategic Guidance,” from *NATO Strategy Documents 1949-1969*, edited by Dr Gregory W. Pedlow, Chief, Historical Office, Supreme Headquarters Allied Powers Europe, <http://www.nato.int/archives/strategy.htm> [accessed 10 April 2008].

⁸⁹ See David C. Eliot, *Project Vista: An Early Study of Nuclear Weapons in Europe*, Discussion Paper No. 108, Santa Monica: California Seminar on International Security and Foreign Policy, August 1987 and Jane E. Stromseth, *The Origins of Flexible Response: NATO’s Debate Over Strategy in the 1960s*, New York: St Martin’s Press, 1988, pp. 17-18.

In the case of NATO strategy, reliance on nuclear weapons was initially embodied in the NATO Military Committee key documents such as MC 48 (Final) dated 22 November 1954, “The Most Effective Pattern of NATO Military Strength for the Next Few Years.”⁹⁰ Looking to 1957, it was envisaged that:

...during the period under consideration an appreciable number of atomic weapons, along with the capability to deliver them, will become available both to NATO and the Soviets.... the Military Committee has concluded that the advent of atomic weapons systems will drastically change the conditions of modern war.⁹¹

A particular difficulty at this time was the perception that the air defence of Europe was not sufficiently effective, particularly with the introduction of nuclear weapons.⁹² Existing active and passive air defence measures would not provide the necessary defence, and striking at the Soviets’ nuclear weapons prior to an attack on NATO countries and their defence installations was considered the only feasible method.⁹³

At the time that MC 48 was approved, it was envisaged that a war would consist of two phases – an initial intense period of thirty days involving the use of nuclear weapons to gain “atomic superiority,” followed by a phase of undetermined duration with conventional forces supported by nuclear weapons.⁹⁴ To contend with the changed nature of war, the concept of operations contained in MC 48 was based on more modest NATO forces-in-being along with

⁹⁰ MC 48 (Final) 22 November 1954, “North Atlantic Military Committee Decision on MC 48: A Report by the Military Committee on The Most Effective Pattern of NATO Military Strength for the Next Few Years,” from *NATO Strategy Documents 1949-1969*, edited by Dr Gregory W. Pedlow, Chief, Historical Office, Supreme Headquarters Allied Powers Europe, <http://www.nato.int/archives/strategy.htm> [accessed 10 April 2008]. See Sean M. Maloney, *Learning to Love the Bomb: Canada’s Nuclear Weapons During the Cold War*, Washington: Potomac Books Inc, 2007

⁹¹ MC 48 (Final), p. 2.

⁹² Ibid. p. 3. See DHH 73/1223, Series 3, Sub-series 13, Brief on SHAPE Study on Air Defence in the NATO Area of Europe, CC-1084-1 (JPS) 1954.

⁹³ Ibid. p. 3. Such an approach promoted the concept of nuclear deterrence.

⁹⁴ Ibid. p. 5.

“the ability to make immediate use of atomic weapons.”⁹⁵ This approach was to have immediate and long-term implications for the Air Division’s concept of operations and equipment.

Further development of NATO strategy resulted in the endorsement of MC 14/2 dated 23 May 1957, the NATO Military Committee report on the “Overall Strategic Concept for the Defense of the North Atlantic Treaty Organization Area.”⁹⁶ This strategy was viewed as NATO’s adoption of Massive Retaliation.⁹⁷ The revised strategy placed the emphasis on the deterrent value of military forces – the shield forces (the forces-in-being) and the supporting nuclear deterrent forces. The strategic concept still envisaged a two-phase war – the initial nuclear exchange, including the use of thermonuclear weapons, followed by a second phase of undetermined length. However, it was now believed that the intensity of the nuclear exchange during the first phase would seriously impede any sort of mobilization during the second phase.⁹⁸ This second phase was dubbed “broken backed warfare” to describe the type of residual yet uncertain degree of conflict. Key to the revised strategic concept, both for the deterrent strategy and, in the event of war, was the need for air forces to establish air supremacy, along with a strong emphasis on offensive capabilities to strike at Soviet offensive air and missile forces, and to conduct interdiction and close support to NATO land and naval forces.⁹⁹

The transformation of NATO strategy over the five-year period from 1952 to 1957 was to have great implications for Canadian defence policy in general, and the Air Division in

⁹⁵ Ibid. p. 12.

⁹⁶ MC 14/2 (Revised)(Final Decision) 23 May 1957, “Final Decision on MC 14/2 (Revised): A Report by the Military Committee on Overall Strategic Concept for the Defense of the North Atlantic Treaty Organization Area,” from *NATO Strategy Documents 1949-1969*, edited by Dr Gregory W. Pedlow, Chief, Historical Office, Supreme Headquarters Allied Powers Europe, <http://www.nato.int/archives/strategy.htm> [accessed 10 April 2008].

⁹⁷ Stromseth, p. 18.

⁹⁸ Ibid. p. 8.

⁹⁹ MC 48/2 (Final Decision) 23 May 1957, “Final Decision on MC 48/2: A Report by the Military Committee on Measures to Implement the Strategic Concept,” from *NATO Strategy Documents 1949-1969*, edited by Dr Gregory W. Pedlow, Chief, Historical Office, Supreme Headquarters Allied Powers Europe, <http://www.nato.int/archives/strategy.htm> [accessed 10 April 2008].

particular. The implementation of the latest NATO strategy relied upon forces-in-being with just sufficient national logistics support to ensure the conduct of operations during this initial phase, and a much-reduced emphasis on potential mobilization and subsequent logistics support. These changes were based on the concept of a short war. For the Air Division, it would mean that it was no longer required to stock a pipeline of War Reserve aircraft, nor maintain the extensive logistics chain that had been initially developed for the Air Division's support. Though the nuclear threat to NATO air forces called for dispersion to enhance their survivability, ultimately, logistics support was limited to thirty days stocks located "behind the wire" at each of the Air Division's four airfields.

In the interim, USAFE began to equip some of its combat squadrons with nuclear-armed aircraft.¹⁰⁰ This arming of aircraft with tactical nuclear weapons was to intensify after 1957 and into the early 1960s, initially with the five RAF *Canberra*-equipped interdiction squadrons and eventually included other NATO allies (including Canada) that equipped their air forces with nuclear-armed aircraft under US custodial control, a topic that will be discussed in Chapter 6.¹⁰¹ Similarly, within the realm of NATO military exercises, the emphasis on the conduct of a nuclear war began to assume critical importance. The most notable of these exercises was Exercise *Carte Blanche* conducted in June 1955 described as "... the most fantastic war game the world can ever have seen was played out on the airfields and in the skies over Western

¹⁰⁰ See Doug Gordon, "Nuclear Thunderjets," *Aviation News*, Vol. 75, No. 5, May 2013. The USAFE equipped the 20th Fighter Bomber Wing with *F-84G Thunderjets* armed with the Mark 7 nuclear bomb. See also David Rust, "Over the Shoulder A-Bombing," *Aviation History*, Vol. 21, No. 4, March 2011. This article explains the development of the Low Altitude Bombing System (LABS) designed to allow for the release of a nuclear weapon from a tactical fighter.

¹⁰¹ See John Clearwater, *Canadian Nuclear Weapons: The Untold Story of Canada's Cold War Arsenal*, Toronto: Dundurn Press, 1998. See Beatrice Heuser, *NATO, Britain, France and FRG: Nuclear Strategies and Forces for Europe 1949-2000*, Houndsmill, Basingstoke: Macmillan Press Ltd, 1997, for an examination of these nations' approach to NATO and nuclear weapons and Taylor, *Royal Air Force Germany Since 1945* for a detailed view on the re-equipment of the *Canberra* squadrons into the nuclear role.

Germany.”¹⁰² This exercise involved the two complete ATAFs, along with additional air resources from the USAF, RAF and French Air Force operating a total of 3,000 aircraft. Exercise *Carte Blanche* was unique in that it represented the “new way of war” with “355 tactical nuclear bombs being dropped in three days of which 268 fell on German soil.”¹⁰³ The exercise scenario assumed that the explosion of these notional nuclear weapons was to be responsible for up to 1.7 million dead and 3.5 million wounded in West Germany.¹⁰⁴ Within the military context of the exercise, if a nuclear ground burst hit an airfield, it was considered totally destroyed, while an air burst would result a graduated damage assessment and the re-opening of that airfield for flying operations.¹⁰⁵

In the 1950s, even in the early stages of this emerging NATO strategy based on a fundamental reliance on nuclear weapons, notable critics voiced their views, including General Matthew B. Ridgway, the US Army Chief of Staff, followed by his successor, General Maxwell Taylor, who after his retirement, wrote *The Uncertain Trumpet*, a critique of this policy.¹⁰⁶ Similar critics arose in Canada, particularly Lieutenant General Guy Simonds, who had retired as Chief of the General Staff in 1955 and set forth his views in a series of magazine articles in 1956.¹⁰⁷

¹⁰² “Exercise Carte Blanche,” *Flight*, No. 2423, Vol. 68, 1 July 1955, p. 32. See also “Atomic Exercise - Carte Blanche: The Practical Assessment of Future Warfare,” *Flight*, No. 2424, Vol. 68, 8 July 1955.

¹⁰³ Andrew Brewin, *Stand on Guard: The Search for a Canadian Defence Policy*, Toronto: McClelland and Stewart Limited, 1965, p. 31. Brewin was the defence critic for the New Democratic Party during the 1960s.

¹⁰⁴ Ibid. Such civilian casualties were clearly unacceptable to the German authorities, as it was supposedly their territory that NATO was to defend. A later comment from the Vietnam War that “we had to destroy the village in order to save it” shows similar logic in the use of nuclear weapons to defend Western Europe

¹⁰⁵ “Exercise Carte Blanche,” p. 32.

¹⁰⁶ Maxwell D. Taylor, *The Uncertain Trumpet*, New York: Harper & Brothers, Publishers, 1959. Taylor re-entered military service in 1961, as the Chairman, Joints Chiefs of Staff, under the Kennedy administration. See also Ingo Trauschweizer, *The Cold War US Army: Building Deterrence for Limited War*, Lawrence, KS: University Press of Kansas, 2008.

¹⁰⁷ Lieutenant-General Guy Simonds, “Where We Have Gone Wrong on Defence,” *Macleans*, 23 June 1956 and “We’re Wasting Millions on an Obsolete Air Force,” *Macleans*, 4 August 1956.

Nevertheless, during the latter part of the 1950s there was the transformation of NATO strategy from an emphasis on the build up of its conventional forces to modest conventional forces-in-being backed up by nuclear weapons. During this period, nuclear weapons were often regarded as the same as conventional munitions, just with more explosive power.¹⁰⁸ Experienced senior RAF officers such as Michael Armitage and Tony Mason, in *Air Power in the Nuclear Age*, posited the view that for NATO air forces “Tactical air power was no longer primarily concerned with close air support, interdiction or counter-air operations with conventional weapons. Instead, nuclear weapons would be used for interdiction and counter-air tasks.”¹⁰⁹ Similarly, with the premise that only a fraction of the Soviet bombers armed with thermonuclear weapons were required to break through NATO air defences to inflict unimaginably devastating destruction there was the acknowledgement that there was “no strategic requirement for air defence.”¹¹⁰ These changes were to fundamentally alter the utility of the Air Division by the late 1950s and the requirement for a large RCAF fighter formation based in Western Europe.

No. 1 Air Division and Logistics – The Weak Link?¹¹¹

The study of air force logistics is limited, and the study of RCAF logistics has been negligible. The phrase that “amateurs talk about strategy and tactics, while real professionals deal with logistics” has often been used without substance, but it does apply to the RCAF in the 1950s.¹¹² Certainly the service recognized the importance of logistics planning and

¹⁰⁸ See Bertram Frandsen, “*For God’s Sake, Not For Berlin!*” *The British Army and Tactical Nuclear Weapons 1947-1967*, Unpublished MA paper, Kingston: Royal Military College of Canada, April 2001.

¹⁰⁹ M.J. Armitage and R.A. Mason, *Air Power in the Nuclear Age* (Second Edition), Chicago: University of Illinois Press, 1985, p. 199.

¹¹⁰ Ibid.

¹¹¹ Bertram C. Frandsen, *The Golden Age of Logistics in the Royal Canadian Air Force*, unpublished paper presented at the 17th Military History Colloquium, The Laurier Centre for Military Strategic and Disarmament Studies and the Department of History, The University of Western Ontario, London, Ontario, 5 May 2006.

¹¹² Possony, *Strategic Air Power*, p. 35. See **Table 2-1**, Elements of Air Power in Chapter 2.

implementation in order to meet the immediate requirements for expansion to 50,000 personnel, 3,000 aircraft, forty-one operational squadrons and a large training organization. However, such was the urgency in deploying the twelve fighter squadrons to Europe to provide a credible deterrent that there was a weak link in the logistical support needed to sustain war operations.

Canada's armed forces each maintained a separate logistics system.¹¹³ Integrated logistics also did not exist within the alliance. In the words of the *NATO Logistics Handbook*,

The responsibility of nations is to plan and provide the logistics support for their forces to meet Allied plans.... This aim is straightforward but it is important to remember that nations organize and support their armed forces in different ways....¹¹⁴

A distinction must be made between Consumer Logistics, that is, "...the reception of the initial product, storage, transport, maintenance (including repair and serviceability), operation and disposal of materiel," and Production Logistics which focused on "research, design, development, manufacture and acceptance of materiel," tasks that were performed by the Department of Defence Production in the 1950s, though with inputs the Technical Services Branch at Air Force Headquarters (AFHQ).¹¹⁵ Consumer Logistics (now also referred to as "operational logistics") was the purview of the operational flying commands and formations, such as the Air Division.

Within the RCAF, various logistics activities associated with Consumer Logistics were conducted at the strategic, operational and tactical levels. At AFHQ in Ottawa (the strategic level), the Air Staff included the Air Member for Technical Services (Air Vice-Marshal rank) with subordinate Chiefs of Development, Construction Engineering and Materiel (Air

¹¹³ Although the 27th Canadian Infantry Brigade and No. 1 Air Division were stationed in the same theatre, totally separate Lines of Communication from Canada sustained these formations.

¹¹⁴ *NATO Logistics Handbook*, Senior NATO Logisticians' Conference Secretariat, International Staff, Defence Policy and Planning Division, Logistics, NATO Headquarters, Brussels, June 1986 (1st edition).

¹¹⁵ *Ibid.* Production Logistics is now also referred to as "acquisition logistics."

Commodore rank) with the emphasis on policy development. The Air Materiel Command (the operational level), commanded by an Air Vice-Marshal (with 5,341 military personnel) was responsible for the provision of logistics support to the entire RCAF.¹¹⁶ The Air Materiel Base (AMB) concept originally developed for implementation in the home-based Air Materiel Command, was also adopted to support No. 1 Air Division with No. 30 AMB established at Langar, England to support the Air Division located in eastern France and Germany.¹¹⁷

By 1955, No. 1 Air Division consisted of a Division Headquarters (formed 1 October 1952 in Paris, and moved to Metz 13 April 1953) that included a Support Unit, Combat Operations Centre, Tactical Aircraft Control Centre, an Aircraft Control and Warning Squadron, and Telecommunications (Telecom) Squadron, located at Metz, France, and four Fighter Wings as follows: No. 1 Fighter Wing (Marville, France), No. 2 Fighter Wing (Grostenquin, France), No. 3 Fighter Wing (Zweibrucken, West Germany) and No. 4 Fighter Wing (Baden-Söllingen, West Germany). Each Wing consisted of a Wing Headquarters, an Airfield Defence Unit and three Fighter Squadrons with a total of 1,289 military and 118 civilian personnel.¹¹⁸

Air Division logistics support was based on a limited degree of self-sufficiency for each Fighter Wing (the tactical level), augmented by USAFE support arrangements, with operational level support being provided by No. 30 AMB. RCAF logistics policy was “to utilize USAF and RAF resources as far as practicable in order to economize on manpower and materiel resources and to avoid unnecessary duplication.”¹¹⁹ Each Fighter Wing station was self-contained for its basic support needs including supply, construction engineering, ammunition, petroleum oil, and lubricants (POL), administration, and food services. The Wing supply section stocked thirty

¹¹⁶ DHH 96/423, Box 9, File 4, Plan “H” for the RCAF 1 August 1952, Section C, Red Tab 9, p. 80.

¹¹⁷ Ibid. pp. 81 and 85.

¹¹⁸ Ibid. Section C, Tab 4.

¹¹⁹ Ibid. Section C, Red Tab 9, p. 85.

days whilst the Wing maintenance section was designed to conduct aircraft repair requiring a maximum of fourteen days.¹²⁰ A salvage section was established in one Wing to conduct salvage activities on behalf of the four Wings.¹²¹ POL, ammunition, and rations were obtained through the USAF using Logistics Support Arrangement (LSAs).¹²² A NATO pipeline system was eventually created, including the Central European Pipeline System (CEPS) that serviced the Canadian airfields with bulk aircraft fuel.¹²³

Interestingly, Plan H also called for an Air Materiel Wing to be established on the Continent that would operate in the Communications Zone to the rear. The Air Materiel Wing would provide mobile support to the Fighter Wings that were expected to re-deploy from their operating airfields in the event of war. The Air Materiel Wing was to consist of a Mobile Telecom Repair Unit, a Mechanical Engineering Light Repair Unit, Repair and Salvage Unit, Air Stores Park, Fuel and Ammunition Park and a Field Hospital.¹²⁴ When the Air Division was created, this organization was not included, but the need for this type of organization subsequently arose on various occasions and the implications of not creating it were to severely impact on operational readiness. However, in accordance with Plan H, the RCAF adopted a policy that until SHAPE determined specific mobility requirements, RCAF would not establish any Continental based logistics units with the role for providing mobile back-up logistics support.

No. 30 AMB at Langar (Nottinghamshire, England) was activated in September 1952 and Group Captain O.E. McCormick, the Commanding Officer commented that it was “ a common

¹²⁰ Ibid. Section C, Red Tab 9, p. 85.

¹²¹ Ibid. Section C, Red Tab, p. 86.

¹²² DHH 73/1223 File 1825, Minutes of 192nd Meeting of Air Members, 15, 18 and 19 January 1954.

¹²³ The author was the Deputy Command Fuels Officer for Canadian Forces Europe, 1984-86 that included responsibility for CEPS.

¹²⁴ Ibid. Section C, Tab 4.

mistake to regard 30 AMB as merely a big supply depot,” a misperception shared by RCAF non-logistics personnel.¹²⁵ In addition to storage and distribution, its functions included repair and overhaul, and local procurement. A considerable amount of contract work was conducted on behalf of No. 30 AMB by the Department of Defence Production detachment in London. No. 30 AMB consisted of No. 312 Supply Depot that maintained twelve months of stocks and also included the unique function of handling all medical supplies, instruments, and drugs through an attached medical stores detachment, No. 314 Technical Services Unit, and No. 5 Air Movements Unit attached to No. 137 Transport Flight with five Bristol *Freighter* aircraft. The *Freighters* conducted five weekly flights to each of the bases on the Continent, delivering twenty-five per cent of required materiel, approximately 100,000 lbs per month, while the remainder was shipped using train and boat.¹²⁶

The command and control of No. 30 AMB was a contentious issue, as the RCAF logistics concept would have dictated that No. 30 AMB operate as a formation under Air Materiel Command. Given its location and wartime role, however, it was more practical to place No. 30 AMB under command of Headquarters No. 1 Air Division.¹²⁷ Time and distance factors were important considerations when assessing the viability of the support concept. From No. 30 AMB Langar to the No. 1 Air Division airfields, it was approximately 600 km representing 2.5 hours flying time in a *Freighter* (cruising speed 166 mph). In comparison, from the No. 1 Air Division airfields to the Inner German Border (IGB), the distance was approximately 400 km representing less than thirty minutes flying time for aircraft operating from East German or Czech air bases.

¹²⁵ “Pipeline to the Air Division,” *Aircraft*, Vol. 17, No. 10, October 1955.

¹²⁶ *Ibid.*

¹²⁷ DHH 73/1223, File 1824, Minutes of the 176th Meeting of Air Members, 9 June 1953, pp. 2-3.

The perennial issues affecting the logistics readiness of No. 1 Air Division were never resolved, including stockpiling policy and the mobility of logistics support units. The SHAPE policy for holding ninety days of supply at each Wing was based on thirty days in the immediate vicinity with the remaining sixty days held in the communications zone to the rear.¹²⁸ Given the absence of mobile support units, the RCAF was forced to rely on Canadian airfields or USAF storage depots for the storage of its stocks, facilities that would be vulnerable in the event of war. An additional vulnerability was the lines of communications between No. 30 AMB in the UK and the air bases on the continent. The RAF Chief of Air Staff, Marshal of the RAF Sir Dermot Boyle, believed that only Fighter Command aircraft would be allowed to fly across the Channel during the first seven days of war, a situation that might have dire consequences for emergency replenishment of spares support and hence aircraft availability for the Air Division.¹²⁹

Although the RCAF had a plan to implement a phased programme to transform the Air Division into a fully mobile tactical force by 1954, this did not occur.¹³⁰ The AAFCE Emergency Plan called for No. 4 (Fighter) Wing to immediately redeploy from its Baden-Söllingen airfield to a location west of the Rhine River, but the ability to perform this task would have been severely limited by the lack of sufficient vehicles.¹³¹ In time, with the adoption of a NATO strategy based on fighting a nuclear war, the linked issues of stock dispersion and mobility became more crucial to the survivability and hence the effectiveness of the Air Division. Other issues, such as peacetime and wartime support agreements with the USAF, particularly for POL

¹²⁸ DHH 73/1223 File 1825, Minutes of 192nd Meeting of Air Members, 15, 18 and 19 January 1954, p. 4.

¹²⁹ DHH 73/1223, File 2001, 1 Air Division Précis for AOCs Conference 1957, 14-17 January 1957, p. 6.

¹³⁰ DHH 73/1223, File 1823, Minutes of the 145th Meeting of Air Members, 9 January 1952, DDH 73/1223, File 1825, Minutes of 192nd Meeting of the Air Members, 15, 18 and 19 January 1954, pp. 3-4, and DHH 73/1223, File 1826, Minutes of the 218th Meeting of the Air Members, 31 May-1 June 1955.

¹³¹ DHH 73/1223, Minutes of 192nd Meeting of the Air Members, 15, 18 and 19 January 1954.

and rations, were successfully negotiated during this period.¹³² Another successfully resolved issue was the approval for the provisioning of War Reserve Materiel for fuel and ammunition based on the Air Division Unit Establishment of 300 Sabre fighters.¹³³ In 1955, the government finally decided that the Air Division would not maintain a War Reserve of aircraft, a requirement that would have entailed an additional 490 *Sabres* besides the 300 aircraft on the Unit Establishments.¹³⁴ This decision reflected a changing view of war – from the long war to the short war concept.

No. 1 Air Division and the Third World War in the 1950s

So, what would the Third World War been like if it had occurred in 1953? The planning assumptions contained in 1 Air Division RCAF *Operations Plan 1-53* provide some insights:

- Soviet offensive would be launched with little warning
- Allies would defend in depth along the Rhine River
- Soviets would possess air superiority, bordering on air supremacy
- Both Allies and Soviets would use atomic weapons (atomic weapons up to 70 KT could expected to be used in attacks on Air Division airfields)
- Bacteriological and Chemical Warfare might be used by both sides
- Soviets would use all possible means to upset internal order of Allied nations by subversive action of Communist minorities
- Soviet electronic warfare would disrupt signals communication between Air Division HQ and subordinate units¹³⁵

¹³² Ibid.

¹³³ DHH 73/1223, File 1825, 204th Meeting of Air Members, 4 October 1954, p. 3.

¹³⁴ DHH 73/1223, File 1826, Minutes of the 234th Meeting of the Air Members, 31 December 1955.

¹³⁵ DHH 73/423, 1 Air Division Operations Plan 1-53, Metz, France, 1 July 1953, Section I, paragraph 2.

Within the NATO Order of Battle, there were approximately 4,000 combat aircraft. Within the Central Region, AAFCE consisted of two Allied Tactical Air Forces, 2 ATAF in the North and 4 ATAF in the South the latter with approximately 1,200 aircraft consisting of:

12th Air Force (USAF) - 225 fighters

Iere Division Aeriennne (Armée de l'Air) - 696 fighters

No. 1 Air Division RCAF - 300 fighters

Each ATAF was associated with a NATO Army Group in the Central Region. 2ATAF was affiliated with the Northern Army Group (NORTHAG) consisting of British, Canadian, Belgian, Dutch and Luxembourg troops, whilst 4 ATAF was associated with the Central Army Group (CENTAG) with American and French troops.

The conduct of 4ATAF air operations were assigned to two categories, offensive and defensive operations, each including a number of tasks. The offensive tasks included attack of enemy aircraft on the ground and air installations to inflict maximum attrition on enemy air capability, escort of bomber forces, air defence of the combat zone, and close support to ground forces in the event of a major threat or breakthrough on the Rhine river line. Defensive tasks included air defence of the combat zone, particularly Rhine river crossings during withdrawals of Allied forces, and the protection of airfields, depots and equipment stockpiles. Wing Commanding Officers were also to prepare their airfields, installations, equipment and supplies for demolition.¹³⁶

¹³⁶ Ibid.

No. 1 Air Division's mission as laid down by 4ATAF included the following tasks: air defence, air superiority, escort and fighter cover, fighter sweeps against ground targets, close support of ground forces, and visual reconnaissance and strike verification. With the primary task of air defence, No. 1 Air Division could only conduct other types of operations upon the orders of the Commanding General of 4ATAF, its higher operational headquarters.¹³⁷

Soviet air forces confronting NATO included approximately 12,000 aircraft in the tactical air arm, *Frontovaya Aviatsiya* (FA = Frontal Aviation) consisting of *MiG-15* jet fighters, *Il-28* twin-engine jet bombers and *Il-10* piston-engine ground attack aircraft.¹³⁸ There were an additional 1,500 fighters in the *Protivo Vozdushnaya Oborona Strany*, (PVO Strany = Anti-Air Defence of the Nation) that could be used to gain air superiority, while the *Dalnaya Aviatsiya* (DA = Long-Range Aviation) force possessed 600 *Tu-4* medium bombers, that though intended for a strategic role, could be re-assigned to tactical targets.¹³⁹

Clive Baxter described the conduct of a future war in "The 12 Day War" that appeared in *Canadian Aviation* in February 1956.¹⁴⁰ On M-Day, The Russians could begin with massive nuclear attacks on important Western centres. Concurrently, American and British strategic bombers would be streaking towards their targets in the USSR or satellite nations.

For the Air Division, along with the other elements in the ATAFs, the first two days of war would be spent deep in Communist territory supporting the interdiction campaign to destroy

¹³⁷ 1 Air Division Ops Plan, Section 1, paragraph 4 (h).

¹³⁸ For a perspective on the *Frontovaya Aviatsiya*, see Yefim Gordon and Dmitriy Komissarov, *Soviet Tactical Aviation*, Manchester: Hikoki Publications, 2011, particularly, Chapter 3, "The 1950s – the Soviet Air Force's Golden Age."

¹³⁹ 1 Air Division Operations Plan, Annex B.

¹⁴⁰ Clive Baxter, "The 12 Day War," *Canadian Aviation*, Vol. 29, No. 2, February 1956. For other contemporary portrayals of the dire military situation in Europe, see F.O. Miksche, *Unconditional Surrender: The Roots of a World War III*, London: Faber & Faber Ltd, 1952, and Drew Middleton, *The Defense of Western Europe*, New York: Appleton-Century-Crofts, Inc, 1952.

supply lines to isolate the Soviet ground and air forces. Canadian *Sabre* squadrons would be engaged in “enormous and frightening dogfights with vast numbers of Communist fighters” over Czechoslovakia, Poland and other satellite nations. By M+2, all remaining Allied aircraft would swing over to the new role, with half providing defence of NATO ground forces, with the other half continuing the interdiction campaign. Baxter commented “Twelve days after the outbreak of war, Strategic Air Command will have totally destroyed Russia’s ability to continue fighting. If they have not done this, we will have lost the war.”¹⁴¹

Conclusions

The political, economic, and strategic conditions within Canada were aligned to promote a modern and well-equipped RCAF in the post-war period. However, even the deteriorating international situation and Canadian membership in NATO did not portend the creation of a Big Air Force, let alone its overseas deployment to Europe. These developments came about as a result of the Korean War in Asia. With Plan G and subsequently Plan H, Air Force planners had provided the government with a readily implementable programme for RCAF expansion, and it was underwritten with the required political will and financial commitments.

Though there is now a tendency to discount the Canadian contribution to NATO, for a period during the 1950s, the Canadian contribution, particularly the Air Division, was a critical component to Western Europe defence (and indirectly to the defence of Canada). The deployment of No. 1 Air Division represented the concept of forward defence that has been a theme throughout post-war Canadian defence. Canada played a tremendous part in the build up of Western European air power through its contributions of Mutual Aid for hundreds of Allied

¹⁴¹ Baxter, “The 12 Day War.”

aircraft, the development of infrastructure in the form of airfields and ancillary support, and the training of thousands of NATO aircrew. However, akin to the notion of what really counts are “boots on the ground,” so it was with “fighters on the runway” in the form of No. 1 Air Division. It was a remarkable achievement that the RCAF was able to recruit, train, equip and deploy overseas twelve squadrons of 300 modern jet fighters in a period of forty-six months from the announcement on 5 February 1951.¹⁴² However, within a year, even as the build up of the Air Division and the RCAF was occurring, there were concerns about the financial viability of the massive \$5 billion three-year re-armament programme.¹⁴³ This concern was to influence the effectiveness of the Air Division.

The government’s firmness not to submit to external pressures for the proposed second RCAF air division in Europe was illustrated by the “Closing the Gap” negotiations and the February 1952 NATO Lisbon Conference. This confirmed that there were definite limits of how far the government would go regarding its defence commitments. The government acceded to the request to increase the Air Division Unit Establishment from 203 to 300 *Sabre* fighters, but the proposed second Air Division of light bombers was a non-starter. Even the increase to No. 1 Air Division’s operational aircraft strength was subject to limitations. For example, the 1,760 RCAF technicians needed to conduct maintenance on the additional *Sabre* aircraft were not forthcoming.¹⁴⁴ Early in the planning process, it was intended to completely replace the *Sabre*

¹⁴² DHH 73/1223, Series 3, File 1307, Chiefs of Staff Committee, Minutes of the 509th Meeting, 18 October 1951. 300 *Sabre* fighters were available by 31 December 1954.

¹⁴³ DHH 73/1223, Series 3, File 1307, Chiefs of Staff Committee, Minutes of a Special Meeting, 15 January 1952, pp. 2-4.

¹⁴⁴ DHH 73/1223, Series 3, File 1306, Chiefs of Staff Committee, Minutes of 507th Meeting, 25 September 1951, p. 3. The existing technician manpower had to service an increased number of aircraft with a resulting impact on aircraft availability and operational readiness.

day fighter squadrons with the *CF-100* all weather aircraft.¹⁴⁵ Ultimately, this was not affordable and only one squadron in each of the four wings received the *CF-100*.

In addition, airfield ground defence was clearly inadequate. Using RAF Regiment standards as a benchmark, there should have been approximately 2,000 officers and airmen dedicated to the task of passive and active defence.¹⁴⁶ Rather than 500 ground defence personnel at each airfield, the ground defence unit strength was 260 personnel. To fill the gap, technicians and other support personnel might be required to “drop their tools” and participate in the defence of the airfield, but that distraction would mitigate against maximizing aircraft sorties, presumably the *raison d’être* for the Air Division. As well, ground defence weaponry to counter low-level air attack left something to be desired. There were suggestions for trials of 20mm and 40mm anti-aircraft guns, but less effective 0.5 inch machineguns were issued for “morale purposes.”

Though No. 1 Air Division was a war-fighting organization, it suffered from a number of logistics deficiencies that would have severely hampered its effectiveness in war – dispersion, mobility, sufficient stockpiles of supplies, an adequate number of aircraft technicians, and a War Reserve of aircraft – all these matters required additional money and people.¹⁴⁷ The Air Materiel Wing was never established on the continent, and throughout this period, logistics support for the Air Division relied upon the doubtful ability of No. 30 AMB to provide support from England or through arrangements with USAFE that might not endure in the event of war.¹⁴⁸ By 1955 when the last of the four Fighter Wings of the Air Division had been deployed to the Continent, the

¹⁴⁵ DHH 73/1223, Series 3, File 1306, Chiefs of Staff Committee, Minutes of 482nd Meeting, 16 January 1951, pp. 4-5.

¹⁴⁶ DHH 73/1223, File 2000, Minutes of a Conference of AOCs and Group Commanders, 17-18 January 1952, p. 10.

¹⁴⁷ David French has described this chimera of defence (in the case of the British Army of the Rhine) as “Potemkinism.” See David French, *Army, Empire and Cold War: The British Army and Military Policy 1945-1971*, New York: Oxford University Press, 2012. p. 308

¹⁴⁸ DHH 73/1223, File 1825, Minutes of the 207th Meeting of the Air Members, 30 November -1 December 1954 and DHH 73/1223, File 1826, Minutes of the 210th Meeting of the Air Members, 24 January 1955.

winds of change, represented by restraint in defence expenditures and the adoption of the short war concept, had ensured that corrective measures would not be implemented. The Air Division was blessed with excellent aircraft, superior flying training, experienced leadership and high morale. However, if the Third World War had erupted during this critical period of the 1950s, sustainable logistics would have been its Achilles heel.

Whether or not the maintenance of sizable armed forces, including a Big Air Force, provided the Canadian government with a correspondingly greater influence within NATO has been a perennial issue. In examining the situation of the early 1950s, David Bercuson concluded that Canada did have that influence, but only so long as the country was committed to great expansion of its military effort.¹⁴⁹ With the setting of much larger – and still more costly -- force level targets such as at the Lisbon Conference, Canada's interest in military expansion began to wane.¹⁵⁰ As well, the Soviet explosion of a thermonuclear bomb in 1953 started what has been referred to as the “continentalization” of Canadian defence policy with an increased emphasis on North American air defence.¹⁵¹

Another aspect of this strategic re-alignment was the change in the concept of war. Instead of a long drawn out war that involving mobilization of industry and manpower, regular forces-in-being would quickly fight “the twelve day war” in a nuclear environment.¹⁵² The adoption of the short war scenario had significant military, industrial and financial repercussions. There was no longer a requirement to procure hundreds of additional aircraft as War Reserves

¹⁴⁹ David Bercuson, “Canada, NATO, and Rearmament, 1950-1954: Why Canada Made a Difference (But Not For Very Long),” in *Making a Difference? Canada's Foreign Policy in a Changing World Order* edited by John English and Norman Hillmer, Toronto: Lester Publishing Ltd, 1992. p. 104.

¹⁵⁰ Ibid. p. 117.

¹⁵¹ Ibid. p. 106. The remark regarding the “continentalization” of Canadian defence policy has been attributed to Jon B. McLin in *Canada's Changing Defense Policy, 1957-1963: The Problem of a Middle Power in Alliance*, Baltimore: Johns Hopkins Press, 1967.

¹⁵² Baxter, “The 12 Day War.”

and similarly with the diminution of Auxiliary and Reserve personnel, a greatly reduced requirement to provide aircraft and equipment to these squadrons. Consequently, the requirement to stockpile large quantities of fuel, ammunition and other supplies along with an elaborate logistics system was very much reduced with the adoption of a short war concept.¹⁵³ Reductions in military requirements meant that the aviation industry could not be sustained at the high tempo of production that had begun with the Korean War. Most significantly, these military strategic and industrial changes were to affect the financial outlook and the amount of funding that political leaders were willing to be made available to support the defence effort.

Part of the reason for weakening political support was the great extent to which Canadian force structure and weapons procurement proved to be subject to the whims of allied requirements rather than meeting Canadian interests.¹⁵⁴ Douglas Bland argued that

There are...several related factors that cause Canadians to act as dependents in defence matters. One reason is embedded in our military history and Canadian officers' profound lack of confidence in Canada's legitimate right to act as a sovereign nation – especially in matters of defence.... James Eayrs called it “growing up allied,” but in many important aspects Canada's military profession has never grown up at all.... In the post-colonial days Canadians deferred to the British and in both world wars Canadians conceded national command to allied strategies and allied officers.... The NATO experience was no different.¹⁵⁵

One matter that was not discussed at the time was the casualties incurred by the Air Division during its existence from 1951 to 1969. The precise number remains unclear, but the Choloy Military Cemetery, near Nancy, France, includes 122 officers and 146 other ranks that died while serving with No. 1 Air Division.¹⁵⁶ The actual number is probably well over 300, if

¹⁵³ Frandsen, *The Golden Age of Logistics in the Royal Canadian Air Force*.

¹⁵⁴ Douglas L. Bland, *Chiefs of Defence: Government and the Unified Command of the Canadian Armed Forces*. Toronto: Brown Book Company Limited, 1995. p. 14.

¹⁵⁵ *Ibid.* p. 12.

¹⁵⁶ Guy Fortier, “Let's Not Forget Cold War Heroes, *Ottawa Citizen*, 11 November 2000. The Air Force Association of Canada website listing of post-war casualties is difficult to interpret and most likely incomplete.

those lost in the training pipeline are included.¹⁵⁷ For example, 107 *Sabre* pilots were killed including fifty-one flying with the Air Division.¹⁵⁸ *CF-100* flying accidents in Canada and Europe accounted for the loss of ninety-two aircrew.¹⁵⁹ RCAF members also died in the crash of *T-33* jet trainers and *Dakota* and *Freighter* transport aircraft while serving with the Air Division. RCAF losses were estimated at an average of twenty-five to thirty aircrew killed in flying accidents every year.¹⁶⁰ The operation of the Big Air Force during the 1950s had a human cost that has often been forgotten.

It was during this initial NATO air power build up that the three pillars of politics, strategy and technology aligned most closely and effectively, which in turn reflected the close alignment of air force planning and government policies. Aside from the USAF, the RCAF was the leading air force in the European theatre with twelve squadrons comprising 300 aircraft: the superb *Sabre*, the top day fighter of the period. However, there were political limitations to the extent that the government would support RCAF expansion. This was very much evidenced by the government's refusal to consider a second air division equipped with light jet bombers. Similarly, the decisions not to increase the number of ground technicians to support the increased number of *Sabre* fighters, or ensure the logistics self sufficiency or the ground defence of the Air Division clearly indicated there was a limit to the political and fiscal support for the RCAF. Equally troubling was the emergence of a new NATO strategy based on the use of offensive nuclear weapons just as the Air Division achieved its full operating capability in 1954 as a conventionally armed formation designed for the air defence and air superiority roles.

¹⁵⁷ As well, other aircrew was killed in *CF-104* and *CF-18* accidents up to the withdrawal of RCAF units in 1993.

¹⁵⁸ Milberry, *The Canadair Sabre*.

¹⁵⁹ Stephen Lowry, "Pilots Gave Lives," *Ottawa Citizen*, 29 March 2006.

¹⁶⁰ James Pocklington, "Cold War Sacrifices," *Ottawa Citizen*, 16 November 2006.

The forward deployment of the Air Division during the early 1950s did much to realize the idea of the Big Air Force. Even as the Air Division achieved the peak of its effectiveness in 1956-57, however, its future represented a quandary to the RCAF planners in securing the future of the Big Air Force. This will be discussed in Chapter 6.

Chapter 5

Canadian Air Power – Canada Build Up 1950-1957

Introduction

This Chapter will examine the build up of the home-based RCAF during the period from 1950 to 1957. It was the home-based RCAF that represented the bulk of RCAF manpower, budget and equipment. This was the Air Force that was most visible to Canadians, contributing to the airmindedness of the 1950s and the notion of the “Golden Age of the RCAF.” Apart from the Regular RCAF that was to grow in strength to over 50,000 personnel by 1955, there was the principal RCAF Reserve component, known as the Auxiliary Force, University Reserve Training Plan flight cadets, the RCAF Reserve Force Cadet Instructors, the Royal Canadian Air Cadets, the Ground Observer Corps, the RCAF Association, RCAF veterans, the RCN Aviation Branch, the Canadian Army Aviation Branch, DND civilian employees assigned to RCAF units, Department of Defence Production (DDP) employees assigned to the aircraft division, and the Canadian aircraft industry. This large group of people and their families represented a significant number of Canadians who had ties to the elements of air power within a national population of 14 million in 1951.

Chapter 5 will focus on the implementation of Plan H that embodied the Big Air Force, including an examination of the functional command organization that was the framework of the greatly expanded RCAF. The development of each command – Air Defence Command, Tactical Air Command, Maritime Air Command, Air Transport Command, Training Command and Air Materiel Command – will be explored to determine how each contributed to the development of the Big Air Force. The role of the Auxiliary Force will also be included, as this was a key aspect

of the RCAF expansion during the 1950s. Finally, the central role played by the Canadian aviation industry will be discussed.

Impact of Korean War and RCAF Expansion

As noted in Chapter 4, RCAF expansion in the near term after the outbreak of the Korean War was quite limited.¹ The Auxiliary squadrons gave up their *Vampires* in order to equip the Regular squadrons, but the Auxiliary squadrons in turn were re-equipped with a larger number of *Mustangs*, and units that had previously been equipped only with *Harvards* also received *Mustangs*. With the 5 February 1951 announcement of the \$5 billion three-year rearmament programme, RCAF expansion began in earnest, but the immediate priority was for the *Sabre* fighter squadrons assigned to No. 1 Air Division. These NATO squadrons were established and trained in Canada, then deployed overseas. In 1954, with completion of the initial expansion, the RCAF comprised forty-one Regular and Auxiliary squadrons, 3,076 aircraft and over 45,000 Regular Force personnel. One year later, the service reached its target manpower ceiling with 50,000 personnel, a strength maintained for the next decade.

RCAF Organization

The post-war RCAF Command re-organization was essentially complete by July 1953. With the exception of the Tactical Air Command that was to be disbanded in 1959, this Command structure was to remain intact until the integration of the three armed forces in 1965.

¹ There had been considerable criticism expressed with RCAF inadequacies in Exercise Eagle held in the summer of 1949. See Ronald Keith, "Editorial – 'Eagle,' Object Lesson in Air Defense," and A.F. Hailey, "'Eagle' With Tattered Wings," *Canadian Aviation*, Vol. 22, No. 9, September 1949. In response to the outbreak of the Korean War and the resulting international situation, see Ronald Keith, "Editorial- Our Defenses Are Down," *Canadian Aviation*, Vol. 23, No. 8, August 1950. See also Michael Barkway, "Canada Takes a Chance in Air Defence," *Maclean's Magazine*, Vol. 65, No. 7, 22 November 1949.

Air Defence Command

There have been numerous studies of RCAF air defence during the post-war period.² Most studies have correctly focussed on the larger issues of Canada-US military cooperation, and Canadian civil-military relations, particularly the establishment of the integrated North American Air Defence organization (NORAD) in 1957 and the subsequent controversy over arming RCAF aircraft and missiles with nuclear weapons. However, many historians have not appreciated the importance of the development of the RCAF Air Defence Command as the principal component in the Big Air Force concept. The organization was more than pilots and aircraft, and included a complex, continent-wide system of command, control and communications facilities, airfields, radar stations and other infrastructure.

As previously noted, initial post-war planning for the RCAF did not envisage a large air defence organization.³ The balanced air force concept did include fighter squadrons, but this was part of a structure that also included fighter-bomber, fighter-reconnaissance and bomber squadrons. While Air Marshal Leckie, CAS in 1944-47 suggested that a relatively large air defence organization might be needed; his notion of a large air defence organization fell far short of what ultimately developed in the 1950s. Under the February 1951 defence plan for a forty-one squadron air force, the RCAF was to assign nine Regular and ten Auxiliary fighter squadrons to Air Defence Command. These flying squadrons represented only a portion of the total air

² These studies include Joseph T. 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, Melvin Conant, *The Long Polar Watch: Canada and the Defense of North America*, New York: Harper & Brothers, 1962, and Jon B. McLin, *Canada's Changing Defense Policy, 1957-1963: The Problems of a Middle Power in Alliance*, Baltimore: The Johns Hopkins Press, 1967. Two recent PhD theses include Richard Goette, *Canada, the United States and the Command and Control of Air Forces for Continental Air Defence from Ogdensburg to NORAD, 1940-1957*, Unpublished PhD Thesis, Kingston: Queen's University, 2009, and Matthew Trugden, *The Search for Continental Security: The Development of the North American Air Defence System, 1949 to 1956*, Unpublished PhD thesis, Kingston: Queen's University, 2011.

³ DHH 73/1223, Series 3, File 1301, Chiefs of Staffs Committee, Minutes of the 373rd Meeting, 9 December 1946.

defence effort of Canada. Until the introduction of a computerized air defence system in the early 1960s, the Semi-Automatic Ground Environment (SAGE), air defence was a labour-intensive activity, with manual plotting, co-relation and transmission of data much as in the Battle of Britain in 1940. Air Defence Command featured an elaborate Aircraft Control and Warning system that included radar stations across the country and 50,000 civilian members of the Ground Observer Corps who supplemented the radar stations as the “eyes and ears of the RCAF.”⁴

The *Pinetree Line*, the most southern and the first of three radar lines that were ultimately built across Canada, initially included sixteen RCAF manned stations and eighteen USAF manned stations.⁵ Approximately 400 personnel manned each station, consisting of up to 200 military and civilian personnel to support the 200 air force personnel in the resident Aircraft Control and Warning Squadron.⁶ Given the geographical isolation of these stations, there was a need to be self-sufficient with the services and amenities usually associated with a large RCAF station. There were also fourteen Auxiliary Aircraft Control and Warning Squadrons intended to augment the Regular RCAF Aircraft Control and Warning Squadrons. Air Defence Command included an Army Anti-Aircraft Command Headquarters co-located with Air Defence Command

⁴ See Bill Prager, “Ground Observer Role,” *Canadian Aviation*, Vol. 28, No. 8, August 1955, H.C.D. Upton, “The Ground Observer Corps,” *The Roundel*, Vol. 5, No. 8, September 1953, and “Canadian Observer Corps,” *Air Pictorial*, Vol. XIV, No. 2, February 1952. DHH 73/1223, File 1326, Cabinet Defence Committee, Memorandum – “Ground Observer Corps: Establishment of Skeleton Organization.” The original concept called for 150,000 volunteers, then it was reduced to 75,000, though maximum strength did not exceed 50,000.

⁵ *No Boundaries Upstairs*, p. 46. See also Don Nicks et al, *A History of the Air Defence of Canada 1948-1997*, Ottawa: Gilmore Publishing, 1997 and J.E. Mahoney, “Aircraft Control and Warning in the R.C.A.F.,” *The Roundel*, Vol. 6, No. 4, April 1954.

⁶ Nicks, p. 34. As plotting interception targets was still conducted manually similar to the Battle of Britain, the AC&W Squadron was relatively large amounting to approximately 200 personnel, including over 100 in the Operations Flight in order to conduct 24/7 operations. With the introduction of SAGE in the 1960s, the elimination of these manual functions enabled the AC&W squadrons to be reduced in size, but there was still a need to maintain a considerable support staff so that these stations each absorbed well over 200 personnel.

Headquarters at St Hubert with the role of coordinating Medium Anti-Aircraft Regiments that were included in the Army Reserve.⁷

Air Defence Command represented the core of the Big Air Force. By 1957, it consisted of more than 14,500 RCAF Regular personnel out of a service strength that totalled 51,000.⁸ The bulk of the 5,600 Auxiliary Force personnel strength was also dedicated to the air defence role. The significance of this large Air Defence Command was the RCAF's massive investment in a strategic air defence system, an endeavour undertaken by only one other middle power, Sweden.⁹

The growth of the large Air Defence Command represented a new and dark dimension in Canadian air-mindedness: fear of Soviet attack. Aside from polemic books on the air threat by such authors as Alexander de Seversky, there were many alarmist articles in mass-market magazines such as *Mechanix Illustrated*, *Science and Mechanics* and *Popular Science*, American publications that were widely read in Canada.¹⁰

⁷ G.W.L. Nicholson, *The Gunners of Canada: The History of the Royal Regiment of Canadian Artillery, Volume II: 1919-1967*, Toronto: McClelland and Stewart Limited, 1972. The Anti-Aircraft Command at Air Defence Command Headquarters closed 1955. In the interim, some modernization was undertaken with the procurement of American 90mm anti-aircraft guns, while the Second World War British 3.7 inch guns were offered to NATO nations as mutual aid. (DHH 73/1223, File 1324, Cabinet Defence Committee, Minutes of the 69th Meeting, 28 December 1950).

⁸ The growth of Air Defence Command did not stop here, as it attained a maximum strength of 17,000 personnel by 1962.

⁹ See Air Commodore C.L. Annis, "A Real Air Defence is Possible," *Maclean's Magazine*, Vol. 67, No. 40, 12 July 1952 and *The Significance to Air Defence of Some Recent Technical Trends*, Address by Air Commodore C.L. Annis, Acting Air Officer Commanding, Air Defence Command RCAF to the Montreal Air Force Veterans' Association, 12 November 1954. See also DHH 73/1223, Series 1, File 101, G.R. Lindsey, Operational Research Group Internal Memorandum No. 12, *The Summer Study on Air Defence at Project Lincoln*, September 1952, George R. Lindsey, "When is Air Defence Worth While?" *The RCAF Staff College Journal*, 1956. and Ronald Keith, "The Radar Shield: A Case for Co-operation," (Editorial), *Canadian Aviation*, Vol. 24, No. 7, July 1951.

¹⁰ See Herbert Yahraes, "Can Superfighters Stop the Bombers?" *Popular Science*, Vol. 155, No. 2, August 1949, Ralph Coniston, "Can Russia Defeat Us With Atom Bombs?" *Mechanix Illustrated*, Vol. 46, No. 2, February 1950, James Joseph, "Can General Old's 'Eyes' Guard America's Heartland?" *Science and Mechanics*, Vol. XXIII, No. 5, October 1952, and Martin Caidin, "Can Our Guided Missiles Stop Enemy Bombers?" *Mechanix Illustrated*, Vol. 50, No. 7, July 1954. Air defence during the 1950s was the subject of a National Film Board documentary production, entitled *Canada's Air Defence* directed by John Howe and produced in 1956.

The growth of Air Defence Command was undertaken through a slow and incremental approach, both in terms of organization and equipment. When first established in December 1948, Air Defence Command consisted of one Regular fighter squadron. The second Regular squadron was not established until November 1949. Though nominal fighter squadrons had been established in the Auxiliary, they were tokens in terms of the quantity and quality of equipment and were not integrated through any sort of proper Command and Control system. After the outbreak of the Korean War in 1950, there was only a minor expansion of the air defence effort with the acquisition of an additional 100 *Mustang* fighters. On 1 June 1951, the autonomous No. 1 Air Defence Group was raised to full command status within the RCAF as Air Defence Command. At this time, the Auxiliary fighter squadrons were placed under the command of Air Defence Command, the beginning of a Command and Control system. However, the long time required to establish the air defence system raised the ire of the Official Opposition defence critic, Major General George Pearkes who in February 1952 stated that

Canada is virtually defenceless against air attack. In effect Canada has no air defence to direct attack at present...nor is she likely to have for many months to come. Our fighters are nonexistent. If we are to rely upon these auxiliary fighter squadrons to produce the direct defence of Canada, it must be realized that they will very soon have to be equipped with aircraft not less efficient than the CF-100, and it takes a very long time to train pilots and to organize ground crews when the personnel of the fighter squadrons are working solely on a part-time basis. No matter how interested the individuals concerned may be, no matter how much time they are prepared to devote to the study of their work, I am very doubtful whether the auxiliary squadrons can be brought up to that state of efficiency which will enable them to be considered a first-line of defence against air attack here in Canada.¹¹

There was, however, reinforcement of the air defences by squadrons forming in Canada for No. 1 Air Division in NATO. Normally, three squadrons at a time were established and spent a

¹¹ Ross Wilmot, "Canada-U.S. NATO Command," *Canadian Aviation*, Vol. 26, No. 6, June 1953. See also Roy, *For Most Conspicuous Bravery*, p. 277.

year in training prior to dispatch overseas. During their time in Canada, these squadrons, equipped with the *Sabre Mk.2* day fighter, provided an additional forty-eight interceptors to Air Defence Command, until the last of the Air Division squadrons were dispatched overseas in 1953 (see **Table 5-1**).

Table 5-1 Air Defence Command – No. 1 Air Division Sabre Squadrons 1951-53			
Date Established	Squadron	Location	Remarks – to Europe
No. 1 (Fighter) Wing			
1 Mar 51	441	St Hubert	HMCS <i>Magnificent</i> 13-28 Feb 52
1 Sep 51	439	Uplands	Leapfrog I 30 May-14 Jun 52
1 Oct 51	410*	St Hubert	HMCS <i>Magnificent</i> 19 Oct-13 Nov 51
No. 2 (Fighter) Wing			
8 Jan 51	416	Uplands	Leapfrog II 28 Sep-10 Oct 52
1 Nov 51	430	North Bay	Leapfrog II 28 Sep-10 Oct 52
15 Dec 51	421**	St Hubert	Leapfrog II 28 Sep-10

			Oct 52
No. 3 (Fighter) Wing			
1 Aug 51	413	Bagotville	Leapfrog III 7 Mar-6 Apr 53
1 Jul 52	434	Uplands	Leapfrog III 7 Mar-6 Apr 53
1 Aug 52	427	St Hubert	Leapfrog III 7 Mar-6 Apr 53
No. 4 (Fighter) Wing			
1 Nov 52	414	Bagotville	Leapfrog IV 27 Aug-3 Sep 53
1 Jan 53	422	Uplands	Leapfrog IV 27 Aug-3 Sep 53
1 Mar 53	444	St Hubert	Leapfrog IV 27 Aug-3 Sep 53
* Regular Fighter Squadron since 1 Dec 48, ** Regular Fighter Squadron since 15 Sep 49.			

The first *CF-100* equipped squadron for home air defence was not formed until April 1953 due to technical challenges that delayed production of the aircraft. As a long-range all-weather interceptor, the *CF-100* marked a significant increase in Air Defence Command's capabilities. However, the stand up of the *CF-100* squadrons was a relatively slow process. In

addition to producing new fighters and training aircrew, it was necessary to re-activate RCAF stations at North Bay, Cold Lake, Uplands, Comox and Bagotville to accommodate jet fighters. The Air Defence Command was to consist of nine *CF-100* squadrons each of eighteen aircraft at RCAF stations across the country, with an emphasis on the industrial heartland of Eastern Canada. Achieving the target strength of nine squadrons was further delayed with the decision in 1954 to re-equip four of the twelve squadrons in the Air Division with *CF-100* all-weather night fighters in order to improve that formation's capabilities. In late 1956 and early 1957, four of the existing *CF-100* fighter squadrons in Air Defence Command were deployed overseas to join each of the Air Division's four wings. To replace these overseas *CF-100* squadrons, four additional squadrons with *CF-100s* were established within Air Defence Command, with the last squadron coming online by August 1957 (See **Table 5-2**).

Table 5-2 Air Defence Command - Initial CF-100 Squadron Build-Up 1951-54		
Date Established	Squadron	Location
1 Apr 53	445	North Bay
1 Jun 53	423	St Hubert
1 Oct 53	440	Bagotville
15 Mar 54	419	North Bay
21 Jun 54	428	Uplands
1 Oct 54	425	St Hubert
1 Oct 54	432	Bagotville
1 Nov 54	409	Comox
15 Nov 54	433	Cold Lake

Air Defence Command CF-100 Squadrons to No. 1 Air Division 1956-57 (Op Nimble Bat)		
1 Nov 56	445	North Bay
12 Feb 57	423	St Hubert
11 May 57	440	Bagotville
5 Aug 57	419	North Bay
Replacement Air Defence Command CF-100 Squadrons 1956-57		
1 Nov 56	410	Uplands
1 Feb 57	416	St Hubert
1 May 57	413	Bagotville
5 Aug 57	414	North Bay

The Auxiliary fighter squadrons equipped with *Mustangs* and *Vampires* began to replace these aircraft with the *Sabre Mk.5* in 1955 a process that was also completed by 1957. The *Sabre Mk.5* had equipped the Air Division from 1953 to 1955 when replaced with the more advanced *Sabre Mk.6*. Of the ten Auxiliary fighter squadrons, only six were re-equipped with the *Sabre*, the remainder retaining their *Mustang* piston-engine fighters until the aircraft were withdrawn from service in 1956.

The nineteen Regular and Auxiliary fighter squadrons that were ultimately established in Air Defence Command did not provide complete interceptor coverage across the country. However, there were additional fighter aircraft assets that could be called upon. For example, on the East Coast, the forty *Sabre* fighters assigned to No. 1 (Fighter) Operational Training Unit at Chatham, New Brunswick could be made available for fighter tasks if required in an

emergency.¹² There was also No. 3 (Fighter) Operational Training Unit at Cold Lake with fifty *CF-100* all weather fighters whose primary role was to train pilots and radar officers for the operational Air Defence Command squadrons.¹³ As well, the RCN aviation branch maintained two fighter squadrons at HMCS *Shearwater* at Dartmouth, Nova Scotia. Intended for fleet defence on the RCN's sole aircraft carrier, only one fighter squadron at a time was embarked onboard the carrier. From 1948 until 1954, these squadrons were equipped with a total of seventy-four Hawker *Sea Fury*, high performance piston-engine fighters. After 1956, the fighter squadrons re-equipped with thirty-nine second-hand ex-USN McDonnell *Banshee* aircraft, the only jet fighter to be operated by the RCN. The capabilities of the *Banshee* in the air defence role were enhanced with the addition of *Sidewinder* guided air-to-air missiles, the first Canadian fighter to be so equipped. USAF interceptor squadrons were located at Goose Bay, Labrador and Stephenville, Newfoundland along with the USAF Aircraft Control and Warning Squadrons at those stations.¹⁴

By 1954, the original RCAF build-up proposed in Plan H of August 1952 was achieved. The nine Regular *CF-100* equipped squadrons were stationed at Comox, Cold Lake, North Bay, Uplands, St Hubert and Bagotville. The ten Auxiliary squadrons were located at Vancouver, Calgary, Winnipeg, London, Hamilton, Downsview and St Hubert. Joint studies conducted by the RCAF Air Defence Command and the USAF Air Defense Command, however, concluded that this force was insufficient to defend the entirety of Canadian airspace.¹⁵ The Chiefs of Staff

¹² No. 1 (Fighter) OTU was primarily used to train Sabre pilots for No. 1 Air Division. See Victor Koby, "A Post-Graduate Course: Sabre School for Battle," *Canadian Aviation*, Vol. 28, No. 6, June 1955.

¹³ Les Edwards, "Welding the CF-100 Team," *Canadian Aviation*, Vol. 30, No. 2, February 1957.

¹⁴ Lloyd H. Corbett, Jr. and Mildred W. Johnson, *A Handbook of Aerospace Defense Organization 1946-1980*, Office of History, Aerospace Defense Center, Peterson Air Force Base, Colorado, 31 December 1980.

¹⁵ See Victor Koby, "Air Defense Needs Planning," (Editorial), *Canadian Aviation*, Vol. 28, No. 5, May 1955.

Committee therefore sought authorization for an additional six *CF-100* squadrons along with a revised role for the Auxiliary squadrons.¹⁶

It was intended that these changes be implemented in two phases during the period 1957-59 to include the acquisition of new aircraft, additional manpower, the upgrading of existing base facilities and the construction of new bases. The first phase of an additional three *CF-100* squadrons involved a capital expenditure of \$136 million, annual recurring costs of \$37 million and an additional 411 officers, 1,863 other ranks and 683 DND civilians.¹⁷ The second phase with another three *CF-100* squadrons would require \$92 million in capital expenditures, \$33 million in annual recurring costs and an additional 294 officers, 1,402 other ranks and 330 DND civilians.¹⁸ If this programme had been approved, it would have increased the RCAF establishment to 54,110 Regular Force officers, airmen and airwomen, 5,600 Auxiliary officers, airmen and airwomen, and 16,184 DND civilians for a total of 76,294 personnel supporting the RCAF.¹⁹

With this proposed expansion, Air Defence Command would have consisted of fifteen *CF-100* squadrons located at fifteen bases across the country.²⁰ This expansion would have upgraded the facilities at other existing RCAF stations at Val d'Or, Casey (both in Quebec), Namao, Alberta, Gimli, Manitoba and Saskatoon, along with new bases at Kapuskasing, Nakina, Sunstrum (all in Ontario), Prince George, British Columbia and Yorkton, Saskatchewan.²¹ The

¹⁶ DDH 73/1223, Box 20, File 356, Memorandum from Minister of National Defence to Cabinet Defence Committee, "Additional Regular Force Air Defence Squadrons and Bases," 29 February 1956. See also DHH 73/1223, Series 1, Box 89, "Brief for Meeting of Consultation Continental Defence," 2 December 1955.

¹⁷ "Additional Regular Force Air Defence Squadrons and Bases."

¹⁸ Ibid.

¹⁹ Honourable Ralph Campney, Minister of National Defence, *Report on National Defence*, Ottawa: Edmond Cloutier, Queen's Printer and Controller of Stationery, 1957.

²⁰ "Additional Regular Force Air Defence Squadrons and Bases."

²¹ DHH 73/1223, Box 20, File 356. As described in Chapter 4, if the RCAF had implemented a second Air Division of light bombers for NATO, this would have incurred an additional 14,120 RCAF personnel. If added to the Air

effect would be to thicken the air defence north of the principal industrial areas of Quebec and Ontario, and provide air defence across the Prairies and the interior of BC.

A key aspect of the proposal was acknowledgement that the Auxiliary squadrons, which were originally to be re-equipped with the *CF-100* under Plan H, would be unable to meet the increased demands of high readiness and well trained aircrews. The Chiefs of Staff Committee now proposed that six Auxiliary squadrons located in Downsview, St Hubert and Vancouver be each re-equipped with eight *Sabre* fighters and four *T-33* jet trainers “to provide a reserve of trained aircrew and *F-86* aircraft.”²² The remaining four Auxiliary squadrons at Hamilton, London, Winnipeg and Calgary were to be re-equipped with “four light helicopters of the Bell type and four light transport of the Otter type.”²³ These four squadrons would assume a “Disaster and Rescue” role.²⁴ (Three of these four squadrons were re-equipped, not with Bell helicopters or *Otter* light transports, but with the *Expeditor* light transport which was inferior in capabilities to the *Otter*.)²⁵

Cabinet, however, did not approve the expansion plan. Fiscal worries were starting to impinge upon the government’s willingness to sustain a large defence budget. The expansion was to have been implemented during Fiscal Years 1957/58, 1958/59, and 1959/60. Capital expenditures would have amounted to \$228.6 million along with a recurring cost of \$69 million – a significant increase considering the RCAF budget for 1957-58 consisted of \$814 million, a

Defence Command expansion, there would have required 68,230 Regular RCAF personnel along with the Auxiliary and DND civilians for a total RCAF establishment of 90,014. In comparison, the total strength of all three services amounted to 117,177 on 31 December 1956.

²² Ibid.

²³ Ibid. The “Bell type” light helicopter is presumed to be the Bell 47 model.

²⁴ Ibid. This “disaster and rescue role” was intended for operations in the event a nuclear attack, similar to the National Survival role being assigned to the Militia at this time.

²⁵ The fourth Auxiliary squadron, No. 420 Squadron at London, was disbanded 1 September 1956.

decrease from the previous year's budget of \$863 million. For the next two years, the RCAF budget declined further with \$797 million in 1958-59 and \$743 million in 1959-60.²⁶

In terms of equipment, Air Defence Command experienced a rapid turnover and diversity in its equipment over the course of a single decade. When first established in 1948, Air Defence Command consisted of a token number of *Vampire* first generation jet fighters complemented by *Mustang* piston-engine fighters along with several "fighter" squadrons that had so far had been equipped only with *Harvard* trainers. By early 1951, the RCAF's Regular and Auxiliary squadrons were able to muster about eighty-five *Vampire* and 130 *Mustang* fighters.²⁷ The *Vampire* could not be considered as the most modern and effective jet fighter by this time, particularly given the Canadian operating environment.²⁸ However, the *Vampire* served the useful purpose of providing both Second World War aircrew and post-war new entries with experience on operating jet aircraft.

Richard Rohmer, who served as the Commanding Officer of No. 411 Auxiliary Squadron in Downsview in the early 1950s, claimed that the Auxiliary squadrons were the "first line of defence," writing that:

Make no mistake. In 1951 the two *Vampire* squadrons at Toronto had first-line responsibilities for air defence of any Soviet bomber attack against southern Canada. The squadrons were no flying club. They were RCAF units high in personal danger and risk.²⁹

²⁶ See Table 6-1 in Chapter 6 for the RCAF budget.

²⁷ See Jim Lyzun, "Maple Leaf Mustangs: P-51Ds and 'Ks in Canadian Service," *Air Enthusiast*, Vol. 93, May-June 2001, Hugh A. Halliday, "The Problems with Vampires: Air Force Part 38," *Legion Magazine*, April 2010, Robert G. Guillet, "The Vampire Years," *Canadian Aviation Historical Society Journal*, Vol. 43, No. 2, Fall 2005, and J.E. Vernon, "Adventures in Procurement: Canada's First-Generation Postwar Fighters," *Canadian Aviation Historical Society Journal*, Vol. 47, No. 2, Summer 2009.

²⁸ Halliday.

²⁹ Richard Rohmer, *Generally Speaking: The Memoirs of Major-General Richard Rohmer*, Toronto: Dundurn Press, 2004, p. 214.

In reality, given the limited level of training, and the quality and quantity of equipment in the Auxiliary squadrons along with the absence of a modern Aircraft Control and Warning System, only a token defence could have been made in the face of a Soviet bomber attack on Canadian urban areas.³⁰ Nor did it matter, for there were no Soviet bombers with the range to reach Toronto or any other major Canadian city at this time.

North American air defence plans were based on a future threat analysis, rather than actual Soviet operational capabilities. The *Tu-4 Bull* with its maximum unrefuelled range of 3,300 miles represented a threat to the United Kingdom and Alaska, but it was not a threat to the heartland of North America, unless the Soviets were able to capture some Northern airfields from which to launch bombing operations against more southern North American targets. The first Soviet medium jet bomber, the *Tu-16 Badger*, began to enter service in October 1953, but with a range of 3,600 miles still did not present a threat to North America. The Myasishchev *M-4 Bison* that first appeared in 1954 was intended to be an intercontinental range bomber, but technical problems with the aircraft required such extensive modifications that it was essentially a new aircraft that finally emerged in late 1957 with a range up to 7,300 miles and capable of in-flight refuelling that could strike targets in North America.³¹

The most important aircraft in Air Defence Command was the *CF-100* with the first production version, the *Mk.3*, entering service in 1953. It proved to be an effective interceptor fighter throughout the 1950s. Developed to meet the specific Canadian operating environment,

³⁰ This was certainly the view of fellow Progressive Conservative defence critic, George Parkes (see p. 165 above). Rohmer resigned from the RCAF Auxiliary in protest of the weak air defence situation, and pursued partisan politics with the Progressive Conservative Party.

³¹ See Yefim Gordon, *Soviet Strategic Aviation in the Cold War*, Manchester, UK: Hikoki Publications Limited, 2009, pp. 215-230. By the time that the Soviets had an operational intercontinental bomber, their main effort was directed towards the development of ICBMs.

the *CF-100* was superior to contemporary American and British interceptor fighters.³² The aircraft underwent improvements from the initial *Mk.3* version through to the *Mk.4A* and *Mk.4B* and the final *Mk.5* version. The initial *Mk.3* version was equipped with an eight 0.50 inch machinegun belly pack. The *Mk.4* version retained the gun pack, but added wing tip pods each with twenty-nine 2.75 inch unguided Folding Fin Aerial Rockets. The *Mk.5*, the final production version that appeared in 1955, dispensed with the gun pack, but retained the wing tip rocket pods.

A proposed *CF-100 Mk.6* version was intended to be equipped with four *Sparrow II* air-to-air guided missiles. However, this version was cancelled in 1956, based on the premise that the *CF-100*'s replacement, the Avro *CF-105 Arrow* would soon enter service. In retrospect, the cancellation of the *CF-100 Mk.6* was to have a profound effect on the future Air Defence Command fighter component.³³ The realization that the Auxiliary squadrons would not be capable of effectively operating the sophisticated *CF-100* fighter also affected the structure of Air Defence Command. This decision not to re-equip the ten Auxiliary squadrons reduced the requirement for the number of *CF-100* fighters by 180 aircraft, not including attrition or reserve aircraft.³⁴ The 1956 proposal to establish six additional Regular squadrons, which was rejected by the government, would have partly made up this number with a requirement for 108 *CF-100* aircraft, exclusive of attrition or reserve aircraft.

A total of 692 *CF-100* aircraft were produced, including seventy *Mk.3*, 278 *Mk.4A* and *Mk.4B*, and 332 *Mk.5* aircraft. Excluding the *Mk.3* aircraft that were used mostly for training

³² E.R. Johnson, "Stopgap Interceptors," *Aviation History*, Vol. 24, No. 5, May 2014. See H.R. Footitt, "File Analysis: AFHQ S60-3-63 The Avro CF-100," *The Roundel*, Vol. 4, No. 9, October 1952.

³³ See "Penny-wise Cutback Might be Dollar Folly," (Editorial), *Canadian Aviation*, Vo. 30, No. 10, October 1957. This editorial argued that this was a necessary evolutionary stage for both the RCAF and industry. Apart from the introduction of an air-to-air missile system on fighter aircraft, the *CF-100 Mk. 6* was to include afterburners on its engines.

³⁴ DHH 96/24, Box 9, File 4, Plan "H" for the RCAF, 1 August 1952, p.16.

and the fifty-three *Mk.5* aircraft sold to the Belgian Air Force, there were a total of 278 *Mk.4* and 279 *Mk.5* aircraft available for RCAF service for the operational training unit and operational squadrons. By 1957, the four *CF-100 Mk.4* squadrons in No. 1 Air Division (seventy-two aircraft) and the nine *CF-100 Mk.5* squadrons (162 aircraft) in Air Defence Command made a total of 234 operational *CF-100* aircraft in the RCAF. There were fifty additional aircraft for No. 3 (Fighter) Operational Training Unit at Cold Lake, along with other aircraft for attrition and a maintenance reserve. However, with a total production of 557 *CF-100 Mk.4* and *Mk.5* aircraft for the RCAF, there was undoubtedly a surplus of aircraft, particularly in view of the decisions not to equip the Auxiliary squadrons or to establish the six additional Regular squadrons.³⁵

As the *CF-100* was beginning to enter service in 1953, the RCAF was already considering a replacement interceptor fighter. This requirement called for a two seat, twin engine all weather interceptor capable of speeds up to Mach 1.5 and attaining a 60,000 foot altitude.³⁶ The initial requirement called for the production of up to 600 aircraft to re-equip the twelve fighter squadrons in No. 1 Air Division along with the nineteen Regular and Auxiliary fighter squadrons in Air Defence Command. The cancellation of the *Avro Arrow* project by the Progressive Conservative government and its impact on the Big Air Force concept will be discussed in Chapter 6. However, even by December 1955, there were sufficient alarm bells about the efficacy of the project to cause concerns with the Liberal government that resulted in a slowing down of the project.³⁷ As well, there were the emerging strategic and technological changes that were to soon alter the entire concept of air defence. As noted in previous Chapters, these changes were to affect all countries, including the US and the UK. However, unlike the

³⁵ See Robert Bradford, "Canadian Innovation- CF-100 Story," *Air Enthusiast*, No, 44, 1977, p. 165.

³⁶ DHH 73/1223, Series 3, Subseries 13, Air Council #2, Minutes of the 178th Meeting of the Air Members, 7 July 1953.

³⁷ DHH 73/1223, File 1329, Cabinet Defence Committee, Record of Cabinet Decision, 7 December 1955.

major powers, Canada with its singular investment in the *Avro Arrow* project, had little flexibility to consider other nationally based options. With this focus on air defence, the RCAF was ignoring other ongoing air power developments such as the increased emphasis on conventional forces to engage in “brushfire wars” using tactical air support, air transport, or battlefield mobility provided by helicopters.³⁸

In early 1956, Air Defence Command was to reach the peak of its strength of its combat aircraft strength with nine Regular and ten Auxiliary squadrons as shown at **Table 5-3**.

Table 5-3 Air Defence Command – Regular and Auxiliary Squadrons by Base 1956			
Location	Squadron	Aircraft	Remarks
Chatham, NB	No. 1 (Fighter) Operational Training Unit	<i>Sabre</i>	
Bagotville, QC	432, 440 Squadrons	<i>CF-100</i>	
St Hubert, QC	423, 425 Squadrons	<i>CF-100</i>	
St Hubert, QC	401, 438 (Aux) Squadrons	<i>Sabre</i>	
Uplands, ON	428 Squadron	<i>CF-100</i>	
North Bay, ON	419, 445 Squadrons	<i>CF-100</i>	
Downsview, ON	400, 411 (Aux) Squadrons	<i>Sabre</i>	
London, ON	420 (Aux) Squadron	<i>Mustang</i>	Disbanded 1 Sep 56
Hamilton, ON	424 (Aux) Squadron	<i>Mustang</i>	

³⁸ The future of the Air Division in SACEUR had resulted in some discussion in Chiefs of Staff Committee meetings, but in 1957, the RCAF and DND were a long way from making a decision for future re-equipment.

Winnipeg, MB	402 (Aux) Squadron	<i>Mustang</i>	
Calgary, AB	403 (Aux) Squadron	<i>Mustang</i>	
Cold Lake, AB	433 Squadron	<i>CF-100</i>	
Cold Lake	No. 3 (Fighter) OTU	<i>CF-100</i>	
Vancouver	442, 443 (Aux) Squadrons	<i>Sabre</i>	
Comox	409 Squadron	<i>CF-100</i>	

This pinnacle was to be a short-lived as by 1957, strategic uncertainty was beginning to jeopardize the future of the Big Air Force concept.

Tactical Air Command

Though tactical air power to support the Canadian Army was originally envisaged to be a key role for the post-war RCAF, ultimately this turned out not to be the case. The RCAF did not provide significant resources for the ground support role until the late 1960s.³⁹ In the meantime, as described in Chapter 3, land-air warfare concepts and doctrine were kept alive at the CJATC, with tactical air support being provided by mostly Auxiliary squadrons that worked with the Canadian Army MSF. The *Mitchell* was obsolete in 1946 when it was assigned this role; that the RCAF kept the aircraft in service with the light bomber squadrons until 1958 clearly indicates the low priority assigned to this role by the RCAF. Though there were various suggestions regarding a light bomber replacement, none of the proposals gained traction.⁴⁰ One MSF After Action Report recommended that the RCAF squadrons assigned to support the MSF replace their

³⁹ No. 10 Tactical Air Group with its *CF-5* jet tactical fighters was the outcome of the 1964 Defence White Paper, but it was also overtaken by events as will be discussed in Chapter 7.

⁴⁰ John Lyzun, "Twenty Faithful Years: The B-25 in RCAF Service," *Air Enthusiast*, No. 64, July-August 1996. Though obsolete in the bomber role, the *Mitchell* was still a useful aircraft during this period serving as a navigational trainer, and a few as VIP transports.

Second World War- era *Mustangs* and *Mitchells* with two squadrons of *F-84G* jet fighter-bombers and a squadron of *B-45 Tornado* jet bombers.⁴¹ Other proposals were to adapt the *CF-100* interceptor to the tactical bomber role or replace the *Mitchell* with the English Electric *Canberra* light jet bomber.⁴² The revised Plan H of August 1952 included two light twin jet bomber squadrons each of eighteen aircraft to be equipped by April 1957.⁴³ By this time, however, the changed strategic circumstances that raised doubts about the necessity of the MSF precluded replacement with more modern aircraft.⁴⁴

Additional tasks for Tactical Air Command included the operation of the RCAF Survival Training School and Search and Rescue in an extensive region of Western Canada including Alberta, Saskatchewan, northern British Columbia, the Yukon, and the western half of the North West Territories.⁴⁵ Still, considering that there were only two Auxiliary light bomber squadrons allocated in support to the MSF, the personnel and infrastructure overhead associated with Tactical Air Command seemed rather large. Total personnel strength amounted to 1,785 officers and airmen by April 1957.⁴⁶ Tactical Air Command included a large Headquarters at Edmonton whose strength of 237 Regular officers and airmen represented thirteen per cent of the total Command establishment. This percentage compares unfavourably with other Commands such as Training Command HQ – 3 per cent, Air Transport Command HQ – 2.6 per cent, and No. 1 Air Division HQ – 3.6 per cent.⁴⁷ In addition, a considerable number of Regular RCAF staff were

⁴¹ Arnold P. Vaughan, *418 City of Edmonton Squadron History*, Belleville: The Hangar Bookshelf, 1984, p. 77.

⁴² DHH 73/1223, Series 3, File 1305, Chiefs of Staff Committee, Minutes of a Special Meeting, 3 July 1950.

⁴³ DHH 96/24, Box 9, File 4, Plan “H” for the RCAF, 1 August 1952.

⁴⁴ Raymond Stouffer, “Military Culture and the Mobile Striking Force,” in P. Whitney Lackenbauer and W.A. March, eds., *Sic Atur Ad Astra, Canadian Aerospace Power Studies – Volume 4: De-icing Required! The Historical Dimension of the Canadian Air Force’s Experience in the Arctic*, Department of National Defence: Canadian Forces Aerospace Warfare Centre, Trenton, Ontario, 2012.

⁴⁵ “Tactical Air Command,” *Canadian Aviation*, Vol. 28, No. 6, June 1955.

⁴⁶ Tactical Air Command also included one of three RCAF Bands – see E.A. Kirkwood, “The Bands of the RCAF,” *The Roundel*, Vol. 7, No. 7, July-August 1955.

⁴⁷ DHH 96/24, Box 4, File 9, Plan “H” for the RCAF (1 August 1952).

allocated to the manning of several RCAF stations with few aircraft and considerable support to the two operational Auxiliary squadrons; 411 Regular RCAF and 370 DND civilian personnel were assigned to the RCAF stations at Edmonton and Whitehorse. The two operational Auxiliary light bomber squadrons (each with an operational strength of eight *Mitchell* aircraft) were each supported by seventy-one Regular RCAF personnel in addition to the Auxiliary squadron personnel. The largest single unit in Tactical Air Command was the CJATC that included a total of 426 RCAF personnel and eighty-eight DND civilians. The CJATC also included almost one-half of the aircraft allocated to Tactical Air Command that amounted to thirty-three aircraft out of a total of seventy-two aircraft.

In examining the RCAF Tactical Air Command role in supporting the MSF, Raymond Stouffer noted that "...instead of realizing its potential at directing or controlling tactical support operations, TAC's mandate had not progressed much beyond that of North-West Air Command, which it had replaced."⁴⁸ In other words, despite its functional name, Tactical Air Command was a hybrid organization assigned to command the large geographical area of Western Canada. The various studies on the MSF indicated that neither the RCAF nor the Canadian Army were strong service advocates for the MSF role.⁴⁹ In the case of the RCAF, tactical support to the Army was not seen as a priority in the promotion of the Big Air Force concept. As Canadian Army support for the continued existence of the MSF waned, then the rationale for Tactical Air Command also diminished. The two Auxiliary squadrons assigned to support to the MSF, No. 406 and No. 418 Squadrons, relinquished their *Mitchell* light bombers in June 1958 re-equipping with *Expeditor* light transports with initial re-assignment to Training Command, with a further transfer to Air Transport Command in 1961. At one point, RCAF planners suggested to the Chiefs of Staff

⁴⁸ Stouffer. p. 49.

⁴⁹ Ibid.

Committee that Tactical Air Command and Air Transport Command be amalgamated to create an Air Transport and Tactical Command with the emphasis on the air transport aspects.⁵⁰

However, this proposal was rejected and Tactical Air Command was disbanded effective 1 January 1959.⁵¹ Remnants of the Tactical Air Command were distributed between Training Command and Air Transport Command.

The application of effective air power calls for centralized command and control. In this instance, there should have been a single “air component commander” assigned to command and control all RCAF air elements assigned to support the MSF. Eventually, a Tactical Group Headquarters was formed to coordinate air movements and tactical air support for the MSF Brigade Group with this Joint Army/Air Headquarters being established at Winnipeg, but not as a permanent organization.⁵² However, the issue of sufficient airlift for the MSF remained a concern as its required air transport came from Air Transport Command squadrons not Tactical Air Command. These Air Transport Command squadrons were not dedicated to supporting the MSF and had responsibility for other tasks that will be discussed in the Air Materiel Command and Air Transport Command sections below. In addition, though the RCAF and Canadian Army developed the necessary doctrine for airborne operations and air re-supply associated with the MSF, the absence of a permanent joint MSF Headquarters commanding both the Army and RCAF components reinforced the questionable validity for the MSF concept in the first place. CJATC, as a unit in Tactical Air Command also included a small Army aviation component initially focused on the AOP role using light aircraft, but it started to expand in 1955 to include

⁵⁰ DHH 73/1223, Box 20, File 356, Disbandment of Tactical Air Command Headquarters, 14 August 1958. By this time, the only RCAF requirement was to “provide close air support aircraft for demonstrations of the techniques of close air support.” (p. 2). The T-33 armament trainer was considered adequate for this task.

⁵¹ “Taps for T.A.C.,” *The Roundel*, Vol. 11, No. 2, March 1959.

⁵² Sean M. Maloney, “The Mobile Striking Force and Continental Defence 1948-1955,” *Canadian Military History*, Vol. 2, No. 2, Autumn 1993, p. 81.

helicopter reconnaissance for the armoured corps.⁵³ Army interest in aviation continued to grow with plans for helicopters and transport aircraft for battlefield mobility.⁵⁴

With the emphasis for the build up focused on No. 1 Air Division and Air Defence Command, the Tactical Air Command was the Cinderella command in the RCAF. With the demise of the MSF and the retirement of the *Mitchell* bombers in 1958 with no replacement, there was little purpose or interest to maintain Tactical Air Command.

Maritime Air Command

The embryonic RCAF maritime group was also to suffer from Cinderella status throughout the 1950s in terms of status, budget, personnel and aircraft.⁵⁵ Unlike Tactical Air Command, however, Maritime Air Command was to emerge as a well-equipped formation by the end of the 1950s.⁵⁶

Maritime Air Command, as we have seen, had to contend with a competitor – the RCN Aviation Branch that had evolved into a small but efficient air arm with two fighter and two anti-submarine shipboard squadrons. A further enhancement to the RCN was the 1953 decision to

⁵³ “Helicopter pilots for the Army,” *Aircraft*, Vol. 17, No. 11, November 1955. *Canadian Aviation* reported an alleged Army requirement for 100 *Bell 47G-2* helicopters (Vol. 30, No. 2, February 1957). By 1961 however, growth had been limited to a reconnaissance troop with nine *Nomad* helicopters in West Germany with the 4th Canadian Infantry Brigade Group armoured regiment. In the initial post-war period, Canadian Army pilots had flown in the AOP role using British *Auster* aircraft, including Korea. The transition to American equipment began in 1954 with the acquisition of the Cessna *L-19 Bird Dog*. See D.W. Francis, “The Air Observation Post,” *Canadian Army Journal*, Vol. 9, No. 3, July 1951, “‘Bird Dog’ Joins the Army,” *Canadian Aviation*, Vol. 28, No. 2, February 1955, and “Canada’s Airborne Army,” *Canadian Aviation*, Vol. 28, No. 6, June 1955.

⁵⁴ See Victor Koby, “Aviation for Canada’s Army,” *Canadian Aviation*, Vol. 29, No. 5, May 1956, that detailed the Army’s grand aviation plans including small and large helicopters, reconnaissance aircraft and *Caribou* transport aircraft.

⁵⁵ DHH 96/24, Box 4, File 9, Plan “H” for the RCAF (1 August 1952). Original planning for Maritime Air Command envisaged a personnel strength of 2,734.

⁵⁶ With the expansion in the late 1950s, the peak for 1962 was expected to be approximately 4,900 personnel – W.I. Clements, “The Evolution and Current Status of ... Maritime Air Command,” *The Roundel*, Vol. 13, No. 8, October 1961.

procure McDonnell *Banshee* jet fighters.⁵⁷ The peak of development and expansion for the RCN Naval Aviation Branch was reached with the Cabinet decision in 1953 authorizing the production of 100 Grumman *Tracker* anti-submarine aircraft.⁵⁸ The *Tracker*, to be license-built by de Havilland Canada, was to provide the RCN with an advanced state-of-the-art aircraft used by the US Navy. In light of its ongoing competition with the RCN regarding the ownership and operation of maritime aircraft, the RCAF questioned the operational effectiveness and economic efficiency of this purchase.⁵⁹ By 1956, with the acquisition of the *Banshee* fighter, the *Tracker* anti-submarine aircraft and helicopters, the RCN Aviation Branch had achieved its maximum growth with 3,000 officers and men, one aircraft carrier, one shore-based air station, along with five Royal Canadian Naval Reserve flying squadrons.⁶⁰

The previously authorized East Coast maritime reconnaissance squadrons, No. 404 and No. 405 Squadrons at Greenwood, were both operational by August 1951. A third maritime reconnaissance squadron, No. 407 Squadron, was established at Comox on the West Coast on 1 July 1952. The primary role of the maritime reconnaissance squadrons was anti-submarine operations, with the secondary role of anti-surface raider operations, including limited strike operations.⁶¹ Maritime Air Command also included No. 101 Communications Flight at HMCS *Shearwater*, and No. 103 (Greenwood) and No. 107 (Torbay) Rescue Units.⁶² No. 2 (Maritime) Operational Training Unit and the three maritime reconnaissance squadrons were all equipped

⁵⁷ DHH 73/1223, Series 3, File 1308, Chiefs of Staff Committee, Minutes of the 548th Meeting, 9 November 1953. The requirement was for fifty-four *Banshee* fighters allocated as follows: two frontline squadrons – sixteen, reserve – ten, and attrition – twenty-eight. In the end, the RCN acquired thirty-nine *Banshee* aircraft, a far cry from the seventy-four *Sea Fury* fighters that they replaced.

⁵⁸ R.S. Murray, “Why Canada’s Navy Chose Grumman CS2F-1,” *Canadian Aviation*, Vol. 28, No. 2, February 1955. It was not only of benefit to the RCN, but represented a \$100 million stimulus to the aviation industry.

⁵⁹ DHH 73/1223, Series 3, File 1307, Chiefs of Staff Committee, Minutes of the 551st Meeting, 25 November 1953.

⁶⁰ John D. Harbron, “New Fire Power for the RCN,” *Canadian Aviation*, Vol. 29, No. 2, February 1956.

⁶¹ DHH 96/24, Box 4, File 9, Plan “H” for the RCAF (1 August 1952), Section C, Red Tab 5, p. 55.

⁶² Ernie Hemphill, “Search for Underwater Killers,” *Canadian Aviation*, Vol. 29, No. 2, February 1956.

with the *Lancaster Mk. 10MR* aircraft.⁶³ The *Lancaster Mk. 10MR* was a refurbished Second World War *Lancaster Mk. 10* bomber modified to include “nose and tail turrets, sonobuoy capacity, rear-facing F.24 camera, extra fuel tanks, depth charges, radio and radar navigation aids.”⁶⁴ It was only due to the existence of this large number of *Lancaster* aircraft in storage that made it possible for the RCAF to form these maritime reconnaissance squadrons in the early 1950s, as neither the United Kingdom or the United States had maritime aircraft to spare. Initially, the maritime reconnaissance squadron Unit Establishment had been twelve *Lancaster* aircraft, but this was increased to sixteen aircraft by 1954.⁶⁵ The three squadrons, including the West Coast squadron, with their forty-eight aircraft were assigned to NATO under the Supreme Allied Commander Atlantic (SACLANT).⁶⁶

It was recognized in 1949 that the *Lancaster* maritime reconnaissance aircraft was obsolete and a replacement aircraft would be needed by 1955.⁶⁷ The RCAF decided to proceed with a two-aircraft approach for the *Lancaster* replacement.⁶⁸ As an interim replacement for the *Lancaster*, the procurement of twenty-five Lockheed *Neptune* medium-range aircraft was authorized in December 1953.⁶⁹ At the same time, the government approved the procurement of

⁶³ Approximately 100 *Lancaster Mk. 10* aircraft served with the RCAF from 1945 to 1964 primarily for maritime reconnaissance/maritime patrol, photographic survey and reconnaissance, area reconnaissance, and search and rescue. Approximately seventy-five aircraft were modernized for the Mk. 10MR/MP role. See Jim Lyzun, “From Warhorse to Workhorse: Lancaster Mk. 10 Variants in Canada, *Air Enthusiast*,” No. 86, March/April 2000, Hugh A. Halliday, “Lancasters Hit Civvy Street,” *Legion Magazine*, May-June 2010, and Terry Leversedge, “The ‘Veteran’ Work –Horse: The RCAF’s Post-War Lancaster Variants, *Air Force Magazine*, Vol. 36, No. 4, March 2013.

⁶⁴ Halliday.

⁶⁵ DHH 96/24, Box 4, File 9, Plan “H” for the RCAF (1 August 1952).

⁶⁶ “The RCAF and SACLANT,” *Canadian Aviation*, Vol. 26, No. 6, June 1953.

⁶⁷ DHH 73/1223, Box 66, File 1337, Memorandum from Deputy Minister to Chairman, Chiefs of Staff Committee, and Chief of the Air Staff, 18 July 1952, “Cabinet Conclusions for 8 July 1952 – Development of Maritime Aircraft.” See DHH 73/1223, Series 3, Subseries 13, Air Council #2, Minutes of the 179th Meeting of Air Members, 8 July 1953.

⁶⁸ DHH 73/1223, Series 3, Subseries 13, Air Council #2, Minutes of the 179th Meeting of Air Members, 8 July 1953.

⁶⁹ DHH 73/1223, File 1327, Record of Cabinet Defence Committee Decision, 97th Meeting 2 December 1953. See B.C. Kilburn, “New RCAF Lockheed Neptune,” *Canadian Aviation*, Vol. 28, No. 4, April 1955, William J. Cumming, “King of the Seas: Lockheed Neptunes in Canadian Service,” *Air Enthusiast*, No. 76, July-August 1998,

fifty Canadian-built *Bristol Britannia* (later to be named the *Argus*) long-range maritime aircraft.⁷⁰ With the restraints in the 1952-53 budget, the question was raised of reducing or eliminating the *Neptune* contract.⁷¹ Ultimately, this was not considered a feasible approach, as *Lancaster* attrition would reduce the number of available maritime aircraft. *Neptune* aircraft entered service between March and September 1955 with No. 404 and No. 405 Squadrons at Greenwood.

In the case of the new four-engine long-range maritime patrol aircraft, the only other possible candidate was the Avro *Shackleton MR Mk.4*, a Canadian version of the *Shackleton MR Mk.3* then under development for RAF Coastal Command.⁷² Earlier marks of the *Shackleton* (*MR Mk.1 and Mk.2*) were already in service with the RAF. The *Shackleton* was a development of the *Lincoln* bomber, itself a development of the *Lancaster*. The *Shackleton* proposal was rejected as not being much more modern than the existing *Lancaster Mk.10MR*.

In order to provide the proposed maritime patrol aircraft with extended range while operating at lower altitudes, the turbo-prop engines on the *Bristol Britannia* design were replaced with piston-engines and an unpressurized fuselage adopted. The prototype Canadair CP-107 *Argus* was first flown in March 1957 with the aircraft entering RCAF service in 1958. The *Argus* proved itself to be an exceptional maritime patrol/anti-submarine warfare aircraft,

and Wayne Mutza, *Lockheed P2V Neptune: An Illustrated History*, Atglen, PA: Schiffer Military/Aviation History, 1996.

⁷⁰ DHH 73/1223, File 1327, Record of Cabinet Defence Committee Decision, 97th Meeting 2 December 1953. On the *Lancaster* replacement, see also DHH 73/1223, Series 3, File 1308, Chiefs of Staff Committee, Minutes of the 546th Meeting, 7 October 1953. The Cabinet Defence Committee also approved procurement of the 100 RCN *Tracker* shipboard anti-submarine aircraft on 2 December 1953.

⁷¹ DHH 73/1223, Series 3, File 1307, Chiefs of Staff Committee, Minutes of Special Meeting, 15 January 1952.

⁷² See Roger Carvell, "Aeroplane Examines the...Avro Shackleton," *Aeroplane*, Vol. 38, No. 2, February 2010, p. 54.

benefiting both the RCAF and Canadian industry.⁷³ With its development, Canada was one of four Western countries that were able to develop and produce this specialized type of aircraft.⁷⁴ With the introduction of the *Argus* aircraft in 1958, the Command began to enjoy a higher status and increased importance.⁷⁵ The *Argus* replaced the *Neptune* with No. 404 and No. 405 Squadrons on the East Coast, with a third *Argus*-equipped squadron, No. 415 Squadron, being formed at RCAF Station Summerside, PEI. Re-equipment with the *Argus* allowed No. 407 Squadron on the West Coast to retire its *Lancasters* in 1959, substituting them with *Neptune* aircraft. The budget crunch of the late 1950s reduced the *Argus* contract from the originally envisaged fleet of fifty aircraft to thirty-three aircraft, the last being produced in 1960. The reduction in the *Argus* contract also resulted in the *Neptune* aircraft remaining in service with No. 407 Squadron until 1968.

Despite the ongoing animosity between the RCAF and RCN over maritime aircraft, steps were initiated in 1956 to establish closer coordination of anti-submarine activities with the set up of the joint RCN/RCAF “Sea-Air Warfare Committee.”⁷⁶ Subsequently, The “RCN/RCAF Concept of Maritime Operations” was approved by 17 April 1957 and re-affirmed in 1959, with the establishment of an integrated RCN and RCAF Headquarters for Maritime Command Atlantic.⁷⁷

⁷³ See Thomas A. Harvie, “Canadair’s CL-28 Roll-out,” *Canadian Aviation*, Vol. 30, No. 2, February 1957, W.M. Diggle, “Evolution of the Argus,” *The Roundel*, Vol. 10, No. 4, May 1958, Chris Ashworth, “Canada’s ‘All-Seeing Monster’”, *CAHS Journal*, Vol. 30, No. 3, Fall 1992, and Jeff Rankin-Lowe, “Canadair CP-107 Argus,” *International Air Power Review*, Vol. 3, Winter 2001-2002.

⁷⁴ The other countries were France (Breguet *Atlantic*), Great Britain (Avro *Shackleton* and Hawker Siddeley *Nimrod*), and the United States (Lockheed *Neptune* and *Orion*).

⁷⁵ See Clements. Also see Ernest Cable, “Challenging the Submarine Threat: Maritime Air Command and the Cold War,” *Air Force Magazine*, Vol. 33, No. 1, Spring 2009.

⁷⁶ Sean M. Maloney, “Parry and Thrust: Canadian Maritime Forces and the Defence of North America, 1954-62,” *The Northern Mariner*, Vol. XVIII, No. 1, January 2008, p. 45.

⁷⁷ *Ibid.* p. 46 and pp. 51-52. Also Clements, p. 6.

The RCAF had generally won the bureaucratic battles associated with the Big Air Force concept, but in the case of Maritime Air Command and the RCN, these skirmishes resulted in a draw. The RCAF was able to promote the Big Air Force Concept for Maritime Air Command along with new equipment such as the *Neptune* and the *Argus*. At the same time, it had to make concessions to the RCN that enabled its Aviation Branch to flourish throughout the 1950s.

Air Transport Command

In examining the RCAF Command organization during this period, one discovers that there was a hierarchy among the various operational Commands. The top tier Commands were unquestionably Air Defence Command and No. 1 Air Division. The second tier consisted of Maritime Air Command and Air Transport Command, with Tactical Air Command in the bottom tier. Maritime Air Command and Air Transport Command were of similar size in numbers of personnel and aircraft. However, during the 1950s, the similarities ended there. Whereas Maritime Air Command spent over half the decade employing refurbished Second World War *Lancaster* bombers in the maritime patrol role primarily in support to SACLANT in NATO, Air Transport Command was re-equipped with modern transport aircraft and employed world-wide in strategic and tactical roles in support to NATO, the UN and home defence. By the mid 1950s, the increased importance of Air Transport Command ensured that it would be re-equipped to replace its aging equipment. The organization of the Command during the 1950s was to remain intact throughout the Cold War until the 1990s.

For the strategic transport role, No. 426 Squadron at Dorval, Quebec, was equipped with twelve Canadair *North Star* four-engine transports.⁷⁸ This was rather unique as only a few air

⁷⁸ Larry Milberry, *The Canadair North Star*, Toronto: CANAV Books, 1982.

forces, such as the USAF and RAF, operated strategic transport aircraft on global routes. As discussed in Chapter 3, the principal focus of No. 426 Squadron during the Korean War period 1950-54 was supporting the airlift between the continental United States and Japan.⁷⁹ No. 426 Squadron was also heavily tasked in Arctic re-supply flights, other domestic flight schedules, and logistics support to No. 1 Air Division overseas that included thrice-weekly regular scheduled flights between Dorval, Quebec and the United Kingdom.⁸⁰ With the end of the Korean airlift in 1954, new tasks included annual deployment flights to the former Indo-China for Canadian Forces personnel assigned to the International Control and Supervisory Commission and support to Operations *Random* and *Nimble Bat* involving the flyover of *Sabre Mk.5* and *Mk.6* and *CF-100* fighters to No. 1 Air Division.⁸¹ In order to perform its long-range transport role, No. 426 Squadron was to become the largest flying squadron in the RCAF consisting of 440 personnel in 1957.⁸²

In the fall of 1956, No. 426 Squadron participated in Operation *Rapid*, the airlift supporting the United Nations deployment to Egypt in the aftermath of the Suez Crisis.⁸³ This operation was to forever increase the importance of Air Transport Command in general, and strategic airlift in particular, within both the RCAF and the broader Canadian defence context. Strategic airlift was to gradually increase in its importance over the next decade that enabled the government to undertake a broader participation in both UN peacekeeping missions and NATO activities due to the existence of this capability.

⁷⁹ W.D. Stevenson. "Operation 'HAWK'," *The Roundel*, Vol. 6, No. 11, December 1954.

⁸⁰ Laurence Motiuk, *Thunderbirds for Peace: Diary of a Transport Squadron*, Ottawa: Larmot Associates, 2004. See also H.C. Langille, "Royal Canadian Air Force Air Transport Command," *Air Power*, Vol. 1, October 1953.

⁸¹ Motiuk. Op *Random* was the flyover of new *Sabre Mk.5* and *Mk.6* aircraft to Europe and Op *Nimble Bat* was the flyover of the four *CF-100* squadrons to Europe.

⁸² *Ibid.*

⁸³ *Ibid.*

Air Transport Command also included No. 412 Squadron that consisted of *North Star* and Canadair *C-5* four-engine transports, De Havilland *Comet* jet transports, along with *Dakota*, *Mitchell* and *Expeditor* transport aircraft. The RCAF became the first military service in the world to operate jet transport with its *Comets* though disaster elsewhere was to affect their use until modifications were carried out. The two *Comets* had been procured on the premise that four additional *North Star* transports were required by the RCAF but not available from Canadair.⁸⁴ No. 412 Squadron was a VIP transport squadron flying VIP missions in Canada and overseas for high ranked government officials along with the Royal Family when visiting Canada. To conduct its role, No. 412 Squadron was another large squadron with 306 personnel located at RCAF Station Rockcliffe near Ottawa.⁸⁵

The two “workhorse” squadrons in Air Transport Command were No. 435 and No. 436 Squadrons. Formed in 1946 at Edmonton, No. 435 Squadron was initially equipped with the *Dakota* twin-engine transport and used to support tactical transport operations in Western Canada including support to the MSF. In 1952, No. 435 Squadron began partial replacement of the *Dakota* with twelve *C-119 Flying Boxcar* twin-engine transports though four *Dakota* aircraft remained in service with the squadron. No. 436 Squadron was formed at Dorval in 1953 as a second tactical transport squadron also equipped with twelve *Flying Boxcar* and four *Dakota* aircraft. In comparison to the *Dakota*, the *Flying Boxcar* represented a significant improvement in airlift capability not only in matters of range, speed and carrying capability, but was a

⁸⁴ DHH 73/1223, File 1325, Memorandum, Deputy Minister of National Defence to Chief of the Air Staff, 22 October 1951. The original proposal cited a requirement for four *Comets*, a one-to-one purchase to rectify the shortage of *North Star* aircraft. The Cabinet on 5 October had deferred the acquisition of the *Comets* at that time, but subsequently, approval was granted for the procurement of two aircraft. See also T.G. Coughlin, “Jet Travel – A.T.C. Style,” *The Roundel*, Vol. 11, No. 4, May 1959.

⁸⁵ DHH 96/24, Box 9, File 4, Plan “H” for the RCAF, 1 August 1952. No. 412 Squadron moved to RCAF Station Uplands in Ottawa in 1955.

particularly a considerable improvement for parachute operations both for dropping troops and aerial re-supply.⁸⁶ The *Flying Boxcar* transports continued in service with the two squadrons until the mid 1960s. Both squadrons were also tasked for the rapid delivery of high priority cargo from the two Supply Depots co-located at Edmonton and Downsview (No. 436 Squadron had moved from Dorval in 1956). The two *Flying Boxcar* equipped squadrons also assumed much of the Arctic re-supply task from No. 426 Squadron.⁸⁷ The *Flying Boxcar* squadrons were also expected to support the mobility required by the maritime reconnaissance squadrons in their wartime role that expected them to be operating from bases other than their home stations. However, it became problematic for these aircraft to undertake both their logistics roles and be available for parachute operations in support of the MSF. Original procurement plans had called for the acquisition of forty-eight *Flying Boxcar* aircraft, but it was decided that thirty-five aircraft would be sufficient to meet RCAF requirements.⁸⁸

The fifth flying squadron in Air Transport Command was No. 408 Squadron that was not in fact a transport squadron, but was equipped with the *Lancaster P.R Mk.10* photo-reconnaissance and *A.R.Mk.10* area reconnaissance aircraft located at Rockcliffe.⁸⁹ No. 408 Squadron had been the last surviving squadron that formed No. 22 (Photographic) Wing in the late 1940s responsible for the aerial mapping of Northern Canada. Along with its photographic work, No. 408 Squadron was now tasked with “area reconnaissance” of Northern Canada. In

⁸⁶ “Packets for RCAF Boxcars on Wings.” See also Alwyn T. Lloyd, *Fairchild C-82 Packet and C-119 Flying Boxcar*, Hersham: Ian Allan Printing, 2005. For a RCAF pilot’s assessment of the *C-119*, see H.G. “Aussie” Maxwell, “The Fairchild C-119 in the RCAF,” *CAHS Journal*, Vol. 32, No. 1, Spring 1994. According to Maxwell, the major problem with the *C-119* was the inadequate engines. When initially procured in 1952, RCAF *C-119s* had limited telecom and navigation equipment as they were intended for use solely in the tactical role. This deficiency had to be rectified in light of their use for long-range operations in the Arctic and the UN.

⁸⁷ J.D. Harvey, “Spring Re-supply in the Arctic,” *The Roundel*, Vol. 7, No. 8, September 1955.

⁸⁸ DHH 73/1223, Series 3, Sub-series 13, Air Council #2, Minutes of the 156th Meeting of Air Members, 28 May 1952. The original Army requirement to airlift one battalion and also meet RCAF needs was based on forty-eight aircraft. The requirement to airlift the entire MSF Brigade Group was calculated at 114 *C-119* transports. See Maloney, “The Mobile Striking Force and Continental Defence 1948-1955.”

⁸⁹ Halliday, “Lancasters Hit Civvy Street.”

reality, its purpose was to ensure the surveillance of Canadian territory particularly against any incursions by the Soviets.⁹⁰ With its long-range endurance, the *Lancaster* remained suitable for this role until withdrawn from No. 408 Squadron service in April 1964. As part of Plan H in 1952, it had been proposed to re-allocate No. 408 Squadron to Tactical Air Command. This re-allocation did not occur and, in retrospect with the early demise of Tactical Air Command by January 1959, was the correct decision to retain the squadron in Air Transport Command.

As mentioned, the Suez Crisis in 1956 was to provide the impetus for the enhanced importance of Air Transport Command, not only with the strategic airlift provided by No. 426 Squadron *North Star* aircraft, but with other Air Transport Command elements as well.⁹¹ No. 435 and No. 436 Squadrons provided twelve *Flying Boxcar* aircraft organized into No. 114 Communications Flight that operated the airlift of UN forces between Capodichino, Italy and Abu Suweir, Egypt.⁹² In addition, No. 115 Communications Flight was established at El Arish, Egypt with RCAF three *Dakota* and four *Otter* transports to provide theatre support to UNEF I.⁹³ The provision of these limited Air Transport Command resources did have an impact on support to other operations, but the Canadian contribution to UNEF I marked the beginning of numerous RCAF air transport contributions to peacekeeping over the next forty years.

Apart from the four transport squadrons in Air Transport Command, there was No. 4 (Transport) Operational Training Unit equipped with a mixture of *Expeditor*, *Dakota*, *Flying*

⁹⁰ Sean M. Maloney, "Canada's Arctic Sky Spies: The Director's Cut," *Canadian Military Journal*, Vol. 9, No. 1, Spring 2008, and Sean M. Maloney, "The Spies Who Went Out in the Cold," *Macleans Magazine*, 29 October 2007. See also J. Wright, "Staking a Claim: The RCAF Asserts Arctic Sovereignty," *Air Force Magazine*, Vol. 33, No. 1, Spring 2009. According to the No. 408 Squadron history, this "spying" role did not really get underway until the late 1950s.

⁹¹ J.A. Connolly, "Determined on Delivery," *The Roundel*, Vol. 9, No. 1, January-February 1957.

⁹² Lloyd, pp. 136-139. See also Michael K. Carroll, *Pearson's Peacekeepers: Canada and the United Nations Emergency Force, 1956-67*, Vancouver: UBC Press, 2009.

⁹³ E. McVeity, "UNEF's Air Support: A Record of Achievement," *The Roundel*, Vol. 10, No. 2, March 1958.

Boxcar and *North Star* aircraft located at RCAF Station Trenton. Its purpose was to provide the operational crew training for aircrew destined to fly transport aircraft.

Apart from Air Transport Command assets, there were numerous small transport flights located throughout the RCAF that provided integral transport for staff at the Headquarters of the other flying Commands and for Search and Rescue tasks.⁹⁴ No. 1 Air Division included No. 137 Transport Flight equipped with five Bristol *Freighter* aircraft used to support the Air Division on the continent from No. 30 Air AMB at Langar, England. In addition, the Air Division Headquarters maintained a flight of one *Dakota* and four *Expeditor* aircraft, while each of the four Fighter Wings and the AMB was equipped with an *Expeditor* transport. Each of the home-based flying Commands included a number of Communications or Communications and Rescue Units located across the country.⁹⁵ Maritime Air Command included No. 101 Communications Flight at Dartmouth, Nova Scotia with *Expeditor* and *Dakota* aircraft, No. 103 Rescue Unit at Summerside, PEI, with *Lancaster*, *Dakota*, *Canso*, and *Otter* aircraft and a Sikorsky *S-51 Dragonfly* or Vertol *H-21* helicopter while No. 107 Rescue Unit at Torbay, Newfoundland consisted of three *Lancaster* aircraft.⁹⁶ Training Command operated No. 102 Communications and Rescue Flight at Trenton and No. 111 Communications and Rescue Flight at Winnipeg both equipped with *Expeditor*, *Dakota*, and *Otter* aircraft and Sikorsky *S-51 Dragonfly* and Vertol *H-21* helicopters. Air Defence Command operated No. 104 Communications Flight at St Hubert with *Expeditor* and *Dakota* transport aircraft. No. 12 Air Defence Group, a formation within Air Defence Command, included No. 121 Communications and Rescue Unit at RCAF Station Sea Island (Vancouver), the largest unit of this type, equipped with *Lancaster*, *Dakota*, *Otter*, and

⁹⁴ Limited research has been conducted on the histories of these various flying units; one history is Grant Y. Smith, *Seek and Save: The History of 103 Rescue Unit*, Erin, Ontario: The Boston Mills Press, 1990.

⁹⁵ S.R. Miller, "Search and Rescue in the R.C.A.F.," *The Roundel*, Vol. 3, No. 2, January 1951.

⁹⁶ The RCAF obtained its first helicopters in 1947, seven Sikorsky *S-51 Dragonfly*, whose tasks included SAR. In 1953, six Vertol *H-21* twin rotor helicopters (the "Flying Banana") were procured for SAR.

Canso aircraft, and Sikorsky *S-51 Dragonfly* and Vertol *H-21* helicopters. Tactical Air Command included No. 105 Communications and Rescue Unit at Edmonton with *Expeditor*, *Dakota*, and *Otter* aircraft and Sikorsky *S-51 Dragonfly* and Vertol *H-21* helicopters. The Transport Support Flight at the CJTAC included three *Flying Boxcar* and six *Dakota* transport aircraft. To provide logistics support during the construction of the Mid-Canada Line, No. 108 Communications Flight was established 1 June 1954 at RCAF Station Rockcliffe equipped with a total of twenty-two *H-19*, *H-34* and *H-21* helicopters, the only rotary wing unit in the RCAF.⁹⁷ A total of eighty aircraft outside Air Transport Command were allocated to these transport, communications and rescue units, a considerable number in comparison to the 103 transport aircraft in Air Transport Command.

By the late 1950s, Air Transport Command began to undergo changes, including expansion after the disbandment of Tactical Air Command with the absorption of most of its units and bases into Air Transport Command. An additional change was the relinquishment of fighters and bombers by the Auxiliary squadrons in 1958 resulting in their re-equipment with *Expeditor* light transports and their transfer to Air Transport Command by 1961. In recognition of the critical importance of the role played by airlift, the Cabinet Defence Committee in August 1956 approved the proposal to procure new strategic transport aircraft to replace the remaining eighteen *North Star* transports. As was the case with the Canadair *Argus*, the replacement aircraft was based on the Bristol *Britannia* design to be manufactured by Canadair but powered with four turboprop engines. The initial order was for eight *CC-106 Yukon* aircraft with the

⁹⁷ No. 108 Communications Flight consisted of ten *H-19*, six *H-34* and six *H-21* helicopters operating June 1954-May 1958. With the completion of the Mid-Canada Line project, it was renamed No. 5 (Helicopter) Operational Training Unit at Rockcliffe to train *H-21* and *H-34* pilots, the helicopters being utilized for SAR, operating only June-December 1958 until disbanded. See *The Roundel*, Vol. 7, No. 6, June 1955 and S.G. French, "The Mid-Canada Line – Part Three," *The Roundel*, Vol. 10, No. 5, June-July 1958.

intent of the eventual replacement of the *North Star* on a one-for-one basis for a total of twenty-four aircraft.⁹⁸ The RCAF support to UN operations during the Suez crisis resulted in a public call for increased RCAF transport capabilities to enable the rapid deployment of troops, a goal eventually achieved within the next decade.⁹⁹

Training Command

Training Command, with its Headquarters at RCAF Station Trenton, Ontario, developed into the second largest Command in the RCAF during this period. The RCAF had undergone tremendous expansion during the period from 1950 to 1955, and the growth of Training Command was crucial to the development of the Big Air Force concept. The RCAF had based its expansion on an end state of 46,500 trained personnel, along with a constant training population of 3,500 officers and airmen. With 11,180 personnel, Training Command was the second largest Command in the RCAF representing twenty-two per cent of the RCAF personnel establishment, but with 1,003 aircraft on its establishment, this represented thirty-four per cent of the total of 2,968 aircraft in the RCAF in 1956.¹⁰⁰

Apart from training RCAF personnel, a critical Canadian contribution to NATO during this period was the training of NATO aircrew.¹⁰¹ In 1950, the RAF requested that the RCAF undertake annually to train 150 RAF aircrew candidates. The RCAF accepted this commitment, and the training programme was expanded to include aircrew trainees from the other NATO

⁹⁸ DHH 73/1223, Series 1, File 128, Memorandum (Draft) MND to Cabinet Defence Committee (dated 7 June 1956) and Memorandum, MND to Cabinet Defence Committee (dated 28 June 1956). The 7 June draft identified a requirement for forty to fifty strategic transport aircraft for the RCAF in the event of war.

⁹⁹ See “‘Air Power’ Means Transport Too,” (Editorial), *Canadian Aviation*, Vol. 29, No. 12, December 1956 and “Not To Be Underestimated,” (Editorial), *Aircraft*, Vol. 18 No. 10, October 1956. See also J. Gellner, “Mobility for the Forces,” *Aircraft*, Vol. 19 No. 2, February 1957.

¹⁰⁰ Training Command was the second largest RCAF Command in personnel strength, but included the largest number of aircraft. Air Defence Command with 12,000 contained 619 aircraft.

¹⁰¹ Aircrew Training for NATO,” *The Roundel*, Vol. 4, No. 6, June 1952 and “RCAF Training and NATO,” *Canadian Aviation*, Vol. 26, No. 6, June 1953.

nations. During 1952-53, the general expansion of the RCAF added nineteen stations, schools and training units to Training Command, with many of the re-opened stations having been wartime BCATP airfields.¹⁰² This expansion allowed an increase in aircrew training from 460 to 2,540 candidates annually and an increase in annual ground crew training from 3,100 to 9,500.¹⁰³ Apart from the training of additional Canadian aircrew to meet the increased demand, this expansion allowed for the training of 1,400 NATO aircrew annually. The NATO air training plan operated as a mini-BCATP, producing a total of 8,517 graduates between 1950 and 1958 when the programme ended, divided between 3,218 Canadian and 5,299 NATO graduates.¹⁰⁴

The NATO air training for NATO aircrew candidates commenced with English language training (for non-English speakers) at the Language School at RCAF Station London, along with Canadian orientation and familiarization.¹⁰⁵ This was followed by six weeks training with a minimum of twenty-five flying hours on the *Chipmunk* primary trainer at the Primary Flying Training School at RCAF Station Centralia, Ontario, then basic flying training for thirty weeks on the *Harvard* with 165 flying hours at one of three Flying Training Schools located at Moose Jaw, Claresholm or Penhold.¹⁰⁶ With graduation from basic flying training, the pilot candidate moved on to the Advanced Flying School for sixteen weeks with the *T-33 Silver Star* jet trainer

¹⁰² "Aircrew for NATO," *The Roundel*, Vol. 10, No. 5, June-July 1958.

¹⁰³ D.J. Goodspeed (ed). *The Armed Forces of Canada 1867-1967: A Century of Achievement*, Ottawa: Queen's Printer, 1967, p. 221. See "Ground Training in the R.C.A.F.," *The Roundel*, Vol. 8, No. 6, July-August 1956 explains the scope of the numerous ground trades required for the RCAF to function.

¹⁰⁴ "Aircrew for NATO." The original program involved eleven other NATO nations. After 1958, Denmark, Norway and the Netherlands made separate arrangements for training in Canada, along with Germany.

¹⁰⁵ RCAF aircrew candidates were processed through No. 2 Personnel Selection Unit (Officers) at London, followed by No. 1 Officers' School at London and the Pre-Flight School at Centralia, Ontario. See E.P. Sloan, "Aircrew Selection in the R.C.A.F.," *The Roundel*, Vol. 6, No. 11, December 1954.

¹⁰⁶ *Ibid.* Originally post-war training had been conducted solely on the *Harvard* that had a higher failure rate. The *Chipmunk* was introduced resulting in higher retention rates. See Ronald A. Keith, "All Harvard Training Success at Centralia," *Canadian Aviation*, Vol. 22, No. 5, May 1949, and "Two Stage Training Gives Student Pilots Confidence," *Canadian Aviation*, Vol. 28, No. 3, March 1955. See Richard P. Bentham, "Moose Jaw Memories – 1954," *Air Force Magazine*, Vol. 27, No. 2, Summer 2003 that details a URTP flight cadet undergoing *Harvard* training. See also Chuck Sloat, "RCAF Macdonald Revisited," *CAHS Journal*, Vol. 29, No. 1, Spring 1991, that provides a ground crew perspective (in this case, an armourer) of life at a 1950s Training Command station.

for eighty hours flying training. Candidates were awarded their wings on graduation from the Advanced Flying School.

Future *Sabre* pilots were sent to No. 1 (Fighter) Operational Training Unit at Chatham, while pilots destined to fly *CF-100s* or multi-engine aircraft in Air Transport Command or Maritime Air Command were sent to the Instrument Flying School at Saskatoon. Future *CF-100 pilots* underwent a minimum of twenty-two hours flying training on the *T-33*, whilst the future multi-engine maritime and transport pilots underwent more extensive instrument flying training using the *Expeditor* and *Mitchell* aircraft. After graduation from the Instrument Flying School, future *CF-100* pilots were assigned to No. 3 (Fighter) Operational Training Unit at Cold Lake, and future pilots for Maritime Air Command and Air Transport Command were assigned to No. 2 (Maritime) Operational Training Unit at Greenwood and No. 4 (Transport) Operational Training Unit at Trenton respectively.¹⁰⁷ Graduates from the Advanced Flying Schools selected to be flying instructors were sent to the Flying Instructors' School at Trenton.

Observer training was conducted in its entirety at the Air Observers School (part of the RCAF Air Navigation School) at RCAF Station Winnipeg, consisting of a twenty weeks basic observer course followed by seventeen to twenty-six weeks specialized training in three categories: observer (radio), observer (air interceptor) or observer (navigator).¹⁰⁸ This flying training was conducted on twin engine *Expeditor*, *Dakota* or *Mitchell* aircraft. To facilitate this NATO air training plan, a separate formation, No. 14 Training Group with Headquarters at Winnipeg, was established within Training Command, to administer eight RCAF stations in Western Canada.

¹⁰⁷ Ernie Hemphill, "Nest for NATO's 'eagles,'" *Canadian Aviation*, Vol. 30, No. 2, February 1957.

¹⁰⁸ See R. McKee, "The Heritage of the Radio Officer," *The Roundel*, Vol. 4, No. 8, September 1952 and N.W. Emmott, "Stations of the RCAF: RCAF Station Winnipeg," *The Roundel*, Vol. 11, No. 9, November 1959. This article included an examination of training at the Air Observer School and the Central Navigation School.

The RCAF was quickly able to ramp up the training to meet the demands for both the Big Air Force concept in the RCAF and the NATO air training plan for a number of reasons. First, 1951 was considered the year of the “re-tread” by veterans when a significant number of those who joined (or rather re-joined) the RCAF were former wartime aircrew or ground crew from six short years before.¹⁰⁹ During that year, the RCAF expanded by nearly fifty per cent from 22,000 to 35,000 personnel. There were numerous former RCAF personnel who simply needed some refresher training in order to resume their duties as compared to new entries. A second reason for the ability to easily expand was that there were numerous mothballed BCATP stations, particularly in Western Canada, that were still available as training airfields. Still, to re-activate the airfields and flying stations, it was more than simply a matter of turning the lights back on, as runways had to be extended to meet the demands of jet aircraft operations.¹¹⁰

The existence of a good supply of training aircraft and a supporting aircraft industry was the third reason why the RCAF was able to effectively expand its training establishment during the early 1950s. The *Harvard* and *T-33* were manufactured in Canada, whilst the *Mitchell* and *Expeditor* were received from US sources. The *Chipmunk* primary trainer was the first aircraft developed by De Havilland Canada after the Second World War, and it soon entered RCAF service.¹¹¹ The *Harvard* aircraft had been widely used by the RCAF during the Second World War and had been manufactured in Canada by Noorduyn Aviation at Montreal. After the war, Canadian Car and Foundry manufactured a newer version in Canada at its Cartierville plant, along with the refurbishment of numerous wartime *Harvards*.¹¹² With the RCAF expansion commencing in 1951, Canadair undertook the licensed production of 656 *T-33 Silver Star* jet

¹⁰⁹ Goodspeed, p. 221.

¹¹⁰ “The RCAF Grows with Canada’s West,” *Canadian Aviation*, Vol. 26, No. 10, October 1953.

¹¹¹ Fred W. Hotson, *de Havilland in Canada*, Toronto: CANAV Books, 1999, p. 120. The RCAF received a total of 79 *Chipmunks* in two batches.

¹¹² Ronald A. Keith, “New Harvards for Old Trainer Keeps Flying,” *Canadian Aviation*, Vol. 23, No. 6, June 1950.

trainers, a success story for both the RCAF and the Canadian aviation industry.¹¹³ The *T-33* jet trainer was the perfect complement to the RCAF *Sabre* and *CF-100* jet fighters.¹¹⁴ The Lockheed *T-33* jet trainer had been based on a two-seat version of the *F-80* jet fighter that served with the USAF in the late 1940s and early 1950s, including Korean War service. Apart from its advanced training role, the *T-33* was adopted for widespread use by RCAF Regular and Auxiliary fighter squadrons for jet refresher and continuation training, and for tactical fighter training at CJATC.¹¹⁵

Training Command was able to muster 500 *Harvard*, 600 *T-33 Silver Star*, 100 *Mitchell* and 280 *Expeditor* aircraft to conduct aircrew training during the 1950s.¹¹⁶ The availability of large numbers of these multi-engine aircraft such as the *Expeditor*, *Dakota* and *Mitchell* enabled the RCAF to train thousands of observers and multi-engine pilots during this period.¹¹⁷

In addition to the various flying schools of No. 14 Training Group located in Western Canada, Training Command consisted of a myriad of ground training schools, mostly located in Ontario and with several units in Quebec. Training Command stations included Trenton, Aylmer, Camp Borden, Centralia, Clinton, London, and the RCAF College in Toronto, all in Ontario, along with RCAF Station St Jean, Quebec.¹¹⁸ Training Command also included small

¹¹³ Jim Lyzun, "Pure Canadian Silver: Canada's T-Birds," *Air Enthusiast*, No. 72, November-December 1997. For a pilot's perspective, see W.M. "Turbo" Tarling, "T-Bird," *CAHS Journal*, Vol. 29, No. 4, Winter 1991.

¹¹⁴ The soundness of the aircraft's design was attested by its longevity in RCAF service, only being retired in 2005 as a result of defence economies.

¹¹⁵ Much to the disdain of the RCAF, the RCN adopted the *T-33* for jet training and for fighter squadron refresher and continuation training.

¹¹⁶ William Green and John Fricker, *The Air Forces of the World: Their History, Development and Present Strength*, London: Macdonald & Co (Publishers) Ltd, 1958, p. 59.

¹¹⁷ See Bob Butt, *The RCAF and CF Dakota 1943-1989: From Debutante to Matriarch*, Winnipeg: Spartan Printing Ltd, 1989. According to Butt, the seventy-two *Dakotas* (fifty-eight Mk. III and fourteen Mk. IV) were on RCAF strength on 1947. An additional eleven were added in 1951 and sixteen in 1953 (p. 31).

¹¹⁸ At this time, it was referred to as RCAF Station St John's. See J.S. Harrison, "Stations of the RCAF: St John's, P.Q.," *The Roundel*, Vol. 11, No. 8, October 1959.

elements attached to support the RCAF Reserve University Squadrons located at seventeen Canadian universities with a strength of nearly one thousand flight cadets.¹¹⁹

Air Materiel Command

First formed in 1945 as Maintenance Command, the title changed to Air Materiel Command in 1949 to better reflect the complexity of its responsibilities in the new age of air power. Air Materiel Command was a key organization in allowing the RCAF to implement the Big Air Force concept with Air Materiel Command serving as the conduit for the expenditure of the bulk of the RCAF's capital procurement and construction budget. Possony's "elements of air power" had certainly recognized that modern air forces were highly dependent on effective logistics.¹²⁰ The "elements of air power" applicable to logistics, engineering, and construction engineering included the availability of raw materials and fuels, national industrial potential, tool reserves, a high rate of technological progress, communications and electronics, logistics and supplies, the availability of auxiliary services, aircraft, skilled manpower, research and inventiveness, and the interconnected linkages between strategy, tactics and planning.¹²¹ The RCAF clearly understood the importance of these elements with the importance assigned to Air Materiel Command. The command, with its headquarters at Rockcliffe, consisted of 5,341 RCAF officers and airmen along with DND civilian employees.¹²² Air Materiel Command Headquarters conducted the normal Command function of the command and control of its field

¹¹⁹ DHH 96/24, Box 9, File 4. In 1952, Plan H had envisaged an establishment of 1,500 flight cadets enrolled in the URTP. See J.E. Ruch, "The Campus Takes Wing," *The Roundel*, Vol. 3, No. 11, November 1951, and "Summer Service," K.L. Burke, "Impressions of a Flight Cadet," and "Campus Centralia," *The Roundel*, Vol. 11, No. 6, July-August 1959. These articles provided a perspective on URTP summer training.

¹²⁰ See Chapter 2, Table 2-1 Elements of Air Power. Also see Stefan T. Possony, *Strategic Air Power: The Pattern of Dynamic Security*, Washington: The Infantry Journal Press, p. 35

¹²¹ Ibid.

¹²² DHH 96/24, Box 4, File 9, Plan "H" for the RCAF (1 August 1952). See also "Air Materiel Command," *Canadian Aviation*, Vol. 28, No. 12, December 1955. This article was a profile on the Air Officer Commanding of Air Materiel Command, Air Vice-Marshal John L. Plant.

units, but also included the necessary staff to conduct logistics support for the entire RCAF.¹²³ Thus the command headquarters staff included a Chief Logistics Officer at the rank of Air Commodore, along with five logistics staffs and two executive staffs.¹²⁴ The logistics staff consisted of aircraft, armament, equipment general, construction engineering, and telecommunications.¹²⁵

Air Materiel Command Headquarters activities were closely integrated with the AFHQ Air Member for Technical Services (AMTS).¹²⁶ The AMTS staffs were focussed primarily on the development of logistics and engineering plans and policies, and the control of the enormous procurement and construction-engineering budget.¹²⁷ There was also a close relationship between Air Materiel Command Headquarters and the Department of Defence Production that was actually engaged in the procurement of materiel from industry.¹²⁸ The logistics and engineering functions in the RCAF were conducted along several levels of support depending on various factors such as complexity, cost, manpower and location.¹²⁹ Within an operational Command, first line support existed at the squadron or unit level, with second line support being a Station responsibility. Air Materiel Command conducted third line support through its various depots and units.¹³⁰ Fourth line support was provided by industry both in Canada and in other nations.¹³¹

¹²³ "The RCAF Air Materiel Command," *Canadian Aviation*, Vol. 26, No. 12, December 1953.

¹²⁴ *Ibid.*

¹²⁵ *Ibid.*

¹²⁶ "RCAF Procurement – Annual Budget \$600 Millions," *Canadian Aviation*, Vol. 25, No. 12, December 1952.

¹²⁷ "The RCAF AMTS Command," *Canadian Aviation*, Vol. 26, No. 12, December 1953.

¹²⁸ S. G. Cowan, "Supply in the RCAF," *Canadian Aviation*, Vol. 27, No. 3, March 1954.

¹²⁹ To appreciate the complexity of modern aircraft maintenance in the RCAF, see J.A. Verner, "RCAF Maintenance," *Canadian Aviation*, Vol. 26, No. 6, June 1953.

¹³⁰ In the case of No. 1 Air Division, normal third line support was conducted through No. 30 Air Materiel Base at Langar, England. If required, further third line support could be available from Air Materiel Command in Canada.

¹³¹ C.L. Annis, "The Evolution of Air Materiel Command," *The Roundel*, Vol. 14, No. 4, May 1962.

In the case of Air Materiel Command, its functions included materiel management to include procurement, inspection, warehousing, distribution and salvage; policy for engineering and supply functions, materiel requirements forecasting, command and control of units, aircraft testing and acceptance, aircraft ferry in North America, and construction engineering.¹³² With the RCAF expansion, the plan was to organize Air Materiel Command on the basis of two AMBs in Canada with the intent “ to combine, at one location, the functions performed by a supply depot, repair depot, construction engineering unit, explosives depot and technical services unit.”¹³³ Each AMB was to be staffed by 3,000 RCAF personnel and civilian employees.¹³⁴ There was an AMB, to serve eastern Canada that was built upon No. 1 RCAF Supply Depot at Downsview, and the other, for the west, from No. 7 RCAF Supply Depot at Namao.¹³⁵ As we have seen in chapter 4, a third AMB, which formed part of No. 1 Air Division, outside of Air Materiel Command, was established at Langar, England.

The establishment and growth of the two AMBs in Canada were intended to coincide with the expansion of the Operational and Training organization. Despite the initial optimism in Plan H as promulgated in August 1952, the AMBs never were organized as a result of budget constraints that began that same year.

A positive change in the new logistics concept was to concentrate aircraft spares, supporting parts and components at the two supply depots at Downsview and Namao compared

¹³² DHH 96/24, Box 4, File 9, Plan “H” for the RCAF (1 August 1952).

¹³³ Ibid.

¹³⁴ “RCAF Supply Depots,” *Canadian Aviation*, Vol.26, No. 12, December 1953.

¹³⁵ DHH 73/1223, Series 3, Sub-series 13, Air Council #2, Minutes of the 160th Meeting of the Air Members, 9 July 1952. RCAF planners proposed an additional AMB in Canada at Moncton, New Brunswick, the site of No. 5 RCAF Supply Depot. The AMTS suggested that Montreal (despite the absence of a RCAF depot) might be a better location given its large aircraft industry. However, the proposal for a third AMB was a moot point as there was no requirement at that time and it was deleted from RCAF planning.

to the previous distribution method whereby these items were scattered across the country at regional Supply Depots. The increasing use of airlift to deliver high priority supply items across the country was achievable with the co-location of these two supply depots with No. 435 Squadron at Namao and No. 436 Squadron at Downsview, both equipped with Flying *Boxcar* transports. No. 426 Squadron *North Star* aircraft were also available to undertake long-range strategic airlift to deliver high priority cargo, particularly to No. 1 Air Division in Western Europe.

As the AMB concept was not fully implemented for the RCAF, Air Materiel Command units remained scattered across the country. Air Materiel Command was responsible for the command of two RCAF stations, RCAF Station Rockcliffe, and RCAF Station Lincoln Park, Calgary.¹³⁶ The supply units consisted of No. 1 Supply Depot, Downsview, No. 2 Supply Depot, Vancouver, No. 3 Supply Depot, Rockcliffe, No. 5 Supply Depot, Moncton, New Brunswick, No. 7 Supply Depot, Namao, and No. 11 Supply Depot, Calgary.¹³⁷ Explosives storage for the RCAF was performed at No. 13 Explosives Depot, Angus, Ontario, No. 16 Explosives Depot, Debert, Nova Scotia, and by “X” Group at No. 7 Supply Depot, Namao.¹³⁸ There were two repair depots, No. 6 Repair Depot, Trenton and No. 10 Repair Depot, Calgary. The single RCAF construction-engineering unit, intended to operate as a “US Seabee” organization, consisted of No. 2 Construction and Maintenance Unit at Calgary.¹³⁹ Miscellaneous units included No. 10 Technical Services Unit, Calgary, No. 11 Technical Services Unit, Montreal, No. 12 Technical Services Unit, Toronto, the Photographic Establishment, Rockcliffe, and No. 1 Requirements Unit located at the USAF Air Materiel Command base at Wright-Patterson Air Force Base,

¹³⁶ C.L. Annis, “The Evolution of Air Materiel Command.

¹³⁷ G.G.W. Lewis, “Supply Depots in the RCAF,” *The Roundel*, Vol. 8, No. 7, September 1956.

¹³⁸ *Ibid.*

¹³⁹ S.G. French, “No. 2 Construction and Maintenance Unit,” *The Roundel*, Vol. 9, No. 9, November 1957.

Dayton, Ohio. Air Materiel Command flying units consisted of the Central Experimental and Proving Establishment (CEPE) at Uplands for aircraft flight development and testing, and No. 129 (Acceptance and Ferry) Flight responsible for the delivery of RCAF aircraft across North America.¹⁴⁰

RCAF Auxiliary Force and Reserve

Initial planning for the post-war RCAF had envisaged a major role for the Auxiliary squadrons and units. The February 1951 RCAF expansion plan with its build up to forty-one flying squadrons, envisaged twelve Auxiliary fighter and bomber squadrons. The Auxiliary expansion also included Aircraft Control and Warning squadrons, technical training, intelligence and medical units. There were 793 RCAF Regular personnel allocated in support of the Auxiliary squadrons and units, principally from Air Defence Command and Tactical Air Command. Of these 793 personnel, 638 RCAF Regular officers and airmen (eighty per cent) were assigned to support Auxiliary wings, squadrons and units in the larger urban areas including Montreal, Toronto, Vancouver, Hamilton, London, Edmonton, Calgary, and Winnipeg.¹⁴¹ Unlike the Army Reserve that maintained units and sub-units in numerous small towns across the country, RCAF Auxiliary and Reserve units were specifically located in the large urban centres of Canada.

The plan to develop a large Reserve component within the RCAF was curtailed by the 1952-53 defence budgetary restraints. Plan H had proposed an Auxiliary personnel establishment of 14,895 officers and airmen allocated as follows: Group Headquarters – eighty-

¹⁴⁰ "Ferry Flight," *The Roundel*, Vol. 9, No. 5, June 1957.

¹⁴¹ In the case of Saskatoon with a population of 53,000 in 1951, eighty-seven Regular RCAF personnel were assigned to the support of No. 23 Wing (Auxiliary). However, nearby RCAF Station Saskatoon also included a large Regular RCAF population of approximately 500 personnel.

six, Wing Headquarters – 1,922, Squadrons – 5,004, Radar and Communications Squadrons and Aircraft Control and Warning Squadrons – 4,429, Technical Training Units – 2,515, Reserve Medical Units – 611, and Intelligence Units – 328.¹⁴² In addition, there a requirement for a further 10,105 personnel in the RCAF Primary Reserve including the University Reserve Squadrons, RCAF Air Cadet (Officers), student summer training, Reserve Tradesmen Training Plan (RTTP), and those individual personnel undergoing refresher flying or mobilization assignment training.¹⁴³ This proposed Reserve establishment called for a total of 25,000 personnel.¹⁴⁴

No. 1 (Auxiliary) Group Headquarters was formed 15 January 1951 with the intent of commanding No. 11 (Operational) Wing and No. 12 (Technical Training) Wing that included the Auxiliary units in the Montreal area and province of Quebec. However, the Wing Headquarters were not formed, and No. 1 Group directly commanded its subordinate Auxiliary units. No. 2 (Auxiliary) Group Headquarters was formed on 15 January 1951 to command No. 14 (Operational) Wing and No. 15 (Technical Training) Wing that included the Auxiliary units in the Toronto area. The Group Headquarters, intended as the Auxiliary Headquarters link to Air Defence Command Headquarters, were disbanded in March 1957 perhaps reflecting the diminished importance of the Auxiliary for the direct defence of Canada.

A total of nine Auxiliary Wing Headquarters were established (out of a proposed twelve) – with the exception of the Wing Headquarters at Montreal, Toronto and Vancouver (each of two flying squadrons), the wings at Calgary, Edmonton, Saskatoon, Winnipeg, London and Hamilton commanded only one flying squadron, though they did include non-flying units such as Aircraft

¹⁴² DHH 96/24, Box 9, File 4, Plan “H.”

¹⁴³ Ibid.

¹⁴⁴ Ibid. See also D.C. Evans, “The R.C.A.F. Reserve,” *The Roundel*, Vol. 6, No. 1, January 1954.

and Warning squadrons, and other types of Auxiliary units. The role of the Wing was to undertake the necessary administrative and technical functions to allow the squadrons to concentrate on their flying responsibilities.¹⁴⁵

The last of the twelve authorized Auxiliary flying squadrons were formed by 15 September 1951 (No. 443 Squadron in Vancouver), but these squadrons did not achieve their proposed total personnel strength of 5,004 officers and airmen (417 personnel in each squadron).¹⁴⁶ Radar and Communications Units were each established in Montreal and Toronto, along with fourteen (out of seventeen proposed) Auxiliary Aircraft Control and Warning squadrons across the country.¹⁴⁷ Apart from being located in those cities that had an Auxiliary Wing Headquarters with a fighter squadron, independent Aircraft Control and Warning squadrons were established in Halifax, Ottawa, Sherbrooke, Windsor, Quebec City, Trois Rivières and Victoria. As was the case with the Auxiliary flying squadrons, the manning establishment of 4,429 personnel for the Aircraft Control and Warning units was never achieved.¹⁴⁸

The establishment of Technical Training Units and Auxiliary Medical Units achieved a mixed success.¹⁴⁹ Whilst sixteen out of the proposed seventeen Auxiliary Medical Units were established, only nine of the proposed fifteen Technical Training Units were formed.¹⁵⁰ Four Auxiliary Intelligence Units were established in Montreal, Toronto, Winnipeg and Toronto. In

¹⁴⁵ James Pickett, *Into the Sausage Machine: The History of 22 Wing*, North Bay: Bond Printing and Graphics, 1994, p. 63.

¹⁴⁶ DHH 96/24, Box 9, File 4, Plan "H."

¹⁴⁷ Ibid. Plan H had originally proposed two AC&W squadrons each for Toronto and Montreal, along with a squadron in Sydney and St John, NB. See also H.B. Ripstein, "No. 1 Radar and Communications Wing," *The Roundel*, Vol. 3, No. 4, March 1951.

¹⁴⁸ DHH 96/24, Box 9, File 4, Plan "H."

¹⁴⁹ See S.G. French, "Technical Training in the R.C.A.F. Auxiliary," *The Roundel*, Vol. 7, No. 10, November 1955, and C.C. Southward, "Full Marks for Windsor R.T.T.P. Students," *The Roundel*, Vol. 10, No. 9, November 1958.

¹⁵⁰ Technical Training Units were proposed for Moncton, Ottawa, Kitchener, Windsor, Regina and Fort William, but not established.

common with other Auxiliary units, the Medical, Technical Training and Intelligence units did not achieve their desired force levels.¹⁵¹

The Auxiliary fighter squadrons and the Aircraft Control and Warning squadrons each had an assigned role within Air Defence Command, as did the two light bomber squadrons in Tactical Air Command. The Aircraft Control and Warning squadrons were not intended to operate with the fighter squadron in their wing, but rather to augment Regular RCAF Aircraft Control and Warning squadrons. With the announced changes in 1956-57, the twelve Auxiliary flying squadrons underwent radical change. No. 420 Squadron (*Mustangs*) was disbanded in 1956, whilst No. 402, 403 and 424 Squadrons exchanged their *Mustangs* for *Expeditor* light transports operating under Training Command by 1957. The two *Mitchell* squadrons, No. 406 and No. 418 Squadrons exchanged these aircraft for the *Expeditor* under Training Command in 1958. The remaining six Auxiliary fighter squadrons that had only converted to the *Sabre Mk. 5* in 1956 exchanged their aircraft for the *Expeditor* under Air Transport Command control in 1958.

The Auxiliary flying squadrons had operated as part of the “sharp end” of Air Defence Command since 1951 and as part of Tactical Air Command since 1947, but they were now transferred to Air Transport Command or Training Command. The Aircraft Control and Warning squadrons still reported directly to Air Defence Command, but by 1961 all Auxiliary Aircraft Control and Warning squadrons were disbanded with the introduction of the SAGE system that automated the air defence functions conducted by these units. The four Auxiliary

¹⁵¹ DHH 96/24, Box 9, File, Plan “H.”

Intelligence Units had only been formed in 1953, but they were disbanded by 1958 in the face of budget cuts. Similarly disbandment of the Medical and Technical Training Units started in 1958.

There was no single predominant factor that could be attributed to the demise of the Auxiliary Force by the late 1950s.¹⁵² Contrary to Richard Rohmer's view that the Auxiliary squadrons were the "first line of defence," this was never the case; the readiness of these squadrons was always at "M (Mobilization) Day + 90."¹⁵³ Official RCAF correspondence and anecdotal evidence from other Auxiliary Force members provide a more moderate assessment of the RCAF Auxiliary.¹⁵⁴ Fiscal restraint, technological advance, personnel limitations, and strategic uncertainty all played a part in the decline of the RCAF Auxiliary.

By the mid 1950s, the government was searching for defence economies – even in the RCAF that continued to enjoy the largest share of the DND budget. The decision that air defence needed to be available "24/7" operating the *CF-100* interceptor effectively excluded the Auxiliary squadrons. In addition, the declining importance assigned to the MSF ended the need for tactical air support from the *Mitchell* bomber squadrons. Advancing technology with the introduction of the SAGE system into air defence operations superseded the Auxiliary Aircraft Control and Warning squadrons. A persistent Auxiliary weakness was its inability to provide the necessary maintenance using its own personnel due to the high annual turnover (forty per cent)

¹⁵² Sandy Babcock, "Withered on the Vine: The Postwar RCAF Auxiliary," in *Canadian Military History Since the 17th Century*, 5-9 May 2000, Ottawa: Department of National Defence (A-JS-007-DHH/AF-001), 2000.

¹⁵³ DHH 7/1223, Box 9, File 4, Plan "H" for the RCAF (1 August 1952), Section E, Orange Tab 1, p. 151.

¹⁵⁴ See George Stewart, "Auxiliary Pilot," *CAHS Journal*, Vol. 47, No. 3, Fall 2009, Leo Pettipas, "Summer Camp," *Air Force Magazine*, Vol. 34, No. 1, Spring 2010, "New RCAF Auxiliary Prove Their Mettle," *Canadian Aviation*, Vol. 27, No. 8, August 1954, Chick Childerhose, "Their Sunday Punches Help to Get the Reserve off Paper and into the Air," *Canadian Aviation*, Vol. 29, No. 7, July 1956, and E.R.T. Park, "On Watch to Strike," *Canadian Aviation*, Vol. 30, No. 6, June 1957. See also the following squadron histories that describe 1950s Auxiliary squadron activities – 400 "City of Toronto" Squadron, 411 "County of York" Squadron and 442 "City of Vancouver" Squadron.

of Auxiliary ground crew.¹⁵⁵ By the late 1950s, another Auxiliary personnel issue was the approaching mandatory retirement for many of its aircrew with wartime experience.¹⁵⁶ The loss of the fighter and bomber roles and the conversion to light transport for disaster and rescue tasks exacerbated the recruiting and retention challenges.¹⁵⁷ These difficulties were compounded by the inability of the Regular RCAF to effectively explain the new Auxiliary flying role.¹⁵⁸ Uncertainty arose from the changed strategic environment: a nuclear war would be over within a matter of days, leaving no time to mobilize reserve forces.¹⁵⁹

The demise of the Auxiliary Force in the late 1950s represented a grievous blow to the Big Air Force concept with the loss of the numerous units that had provided the RCAF with a “footprint in the community.” Though there were RCAF units located near Canadian urban areas, these units were still geographically and, more important, socially isolated from the general Canadian population. The fate of the Auxiliary in fact signalled broader difficulties in perpetuating the Big Air Force concept.¹⁶⁰

¹⁵⁵ Babcock, “Withered on the Vine,” p. 400. Each Auxiliary fighter squadron included a Regular RCAF support detachment of thirty-six personnel, whilst the Regular support detachment with the two bomber squadrons each consisted of seventy-one personnel. There was also the high financial cost associated with the intensive maintenance requirements for the older aircraft operated by the Auxiliary.

¹⁵⁶ Ibid.

¹⁵⁷ Ibid. p. 398. The National Survival Training Role also decimated the Canadian Army (Militia) during the late 1950s and early 1960s.

¹⁵⁸ Ibid.

¹⁵⁹ Ibid. p. 397. See also, F.J. Hatch, “Salute to the Auxiliary,” *The Roundel*, Vol. 16, No. 3, April 1964.

¹⁶⁰ Under fiscal realities, the RCAF had wanted to disband all the Auxiliary flying squadrons, but political pressure from the MND prevented the implementation of this measure, so that ten Auxiliary light transport squadrons survived until 1964. As a comparison, The RAF disbanded all its RAF Auxiliary squadrons (which had been operating fighters) in 1957.

Canadian Aircraft Industry

The Big Air Force concept would not have been easily achievable during this period without the existence of a thriving Canadian aircraft industry.¹⁶¹ The outbreak of the Korean War in 1950 provided the impetus for the tremendous expansion of the Canadian aircraft industry, particularly with the 1951 defence programme that emphasized the build up of the Big Air Force with its forty-one operational squadrons, a large training organization and 3,000 aircraft.¹⁶² Over the next decade, the industry was to produce a previously unimaginable number of fighters, trainers, anti-submarine and transport aircraft both for the RCAF and foreign air forces.¹⁶³ The production of 1,815 Canadair *Sabre*, 692 Avro Canada *CF-100* and 656 Canadair *T-33 Silver Star* jet aircraft was illustrative of the magnitude and importance of the Canadian aircraft industry during the 1950s.¹⁶⁴ During the Second World War, seventy per cent of the 16,000 aircraft produced by Canadian aircraft industry had been trainer aircraft. During the 1950s, of the approximately 4000 military aircraft produced, sixty-six per cent were combat aircraft.¹⁶⁵ At the peak of this production in 1953, eighty per cent of total aircraft orders were assigned to military

¹⁶¹ See Lawrence Aronsen, “‘A Leading Arsenal of Democracy’: American Rearmament and the Continental Integration of the Canadian Aircraft Industry, 1948-1953,” *The International History Review*, Vol. 13, No. 3, August 1991

¹⁶² *House of Commons Debates*, 21st Parliament, 4th Session, 5 February 1951.

¹⁶³ See Ronald A. Keith, “Canadian Aircraft Industry Booming,” *Canadian Aviation*, Vol. 23, No. 12, December 1950, and “Air Industry Program Shifts to War Stride Backs RCAF Expansion,” *Canadian Aviation*, Vol. 24, No. 2, March 1951. See also H.R. Footitt, “R.C.A.F. Progress at Avro Canada,” *The Roundel*, Vol. 2, No. 11, October 1950, and “New Life to the Aircraft Industry,” *Aircraft*, Vol. 12, No. 10, October 1950.

¹⁶⁴ See Milberry, *Canadair Sabre and Avro CF-100*. For the Canadair T-33, see Lyzun, and “Lockheed T-33A Trainer: Canadair to Build It, the RCAF Will Fly It,” *Canadian Aviation*, Vol. 24, No. 7, July 1951.

¹⁶⁵ There was still a need to directly import some American aircraft such as the thirty-five Fairchild *Flying Boxcar* tactical transports and twenty-five Lockheed *Neptune* maritime patrol aircraft. Given the extremely small requirement, all military helicopters were procured from US sources. The RCAF obtained its first seven Sikorsky *S-51 Dragonfly* helicopters in 1947. The next helicopter purchase occurred in 1952 for three *Bell 47* and six *Vertol H-21* twin-rotor helicopters. The largest purchase was the ten Sikorsky *H-19*, six Sikorsky *H-34*, and an additional six *H-21* helicopters in 1954. Both the RCN and Canadian Army procured a very limited numbers of helicopters during these years. British military imports for the RCAF were limited to the two de Havilland *Comet* jet transports and the five Bristol *Freighter* transport aircraft.

sales; the Canadian proportion represented seventy per cent whilst ten per cent were foreign sales.¹⁶⁶

In 1954, it was estimated that there were sufficient defence orders to "...keep the Canadian aircraft manufacturing facilities in full operation until about 1960."¹⁶⁷ Apart from the current *Sabre* and *CF-100* fighter production, there was the ongoing development of a next generation jet fighter, the Avro *CF-105 Arrow*. Based on the Bristol *Britannia* design, Canadair was busy with the development of the *Argus* maritime patrol and *Yukon* strategic transport aircraft.¹⁶⁸ Despite these earlier rosy predictions, by 1956 the Canadian aircraft industry was not working at full capacity.¹⁶⁹ The industry had done exceedingly well since 1949, but the future was uncertain.¹⁷⁰ The production of *Sabre* and *CF-100* fighters ended in 1958.¹⁷¹ The *Argus* and *Yukon* orders were reduced to meet the increased funding requirements needed to sustain to the Avro *CF-105 Arrow* project. The uncertainty in the aircraft industry by 1957 was to have implications both for the Avro *CF-105 Arrow* project and the larger aspects of the Big Air Force concept.

Conclusions

From the perspective of the three pillars of politics and economics, strategy and technology, the key factor that allowed the RCAF to pursue the development and implementation

¹⁶⁶ John Davis, "Aeroplane Industry in Canada," *Canadian Geographic Journal*, Vol. XLVII, November 1953. At the time, the author was director of the economics division in the Department of Defence Production.

¹⁶⁷ "Aircraft Plants To Be Kept Active Until 1960," *Canadian Aviation*, Vol. 27, No. 2, February 1954.

¹⁶⁸ "RCAF Plans to Purchase Britannias," *Canadian Aviation*, Vol. 25, No. 10, October 1952. At this time, it was expected that 80 aircraft would be manufactured. See also "The Canadair Britannia Helps Our Industry," (Editorial), *Canadian Aviation*, Vol. 27, No. 4, 1954.

¹⁶⁹ "The Canadian Industry," *Flight*. Canadair and Avro Canada were not at full capacity production.

¹⁷⁰ See Ernie Hemphill, "Industry Review: Roll-outs, Unveilings Highlight Year of Significant Progress," *Canadian Aviation*, Vol. 30, No. 12, December 1957. See also "Industry's 10-Year Record," *Canadian Aviation*, Vol. 29, No. 1, January 1956.

¹⁷¹ The last of 1,815 Canadair *Sabres* was completed on 9 October 1958, and the last of 692 Avro *CF-100s* was completed on 4 December 1958.

of the Big Air Force concept lay with the political will of the Liberal government of Louis St. Laurent. However, there were a number of mitigating circumstances that allowed the political will to support the massive expansion of the RCAF during this period. The Canadian economy was generally robust enough to allow for the tremendous increase in manpower for the armed forces along with the unprecedented defence budgets. The increasing danger of open conflict in Europe between the West and the Soviet Union only acted as a partial generator of increased defence preparedness before 1950.

The Korean War was the catalyst for the massive Canadian defence expansion announced on 5 February 1951. Closely associated with the more dangerous international situation was the build up of Soviet air power in the form of long-range strategic bombers coupled with the A-bomb after 1949. Fear increased substantially with the Soviet explosion of a thermo-nuclear device in August 1953. This fear was not focused so much on the immediate threat, but on the future threat after 1954.¹⁷²

The continuing prevalence of air-mindedness throughout Canada after the Second World War amongst both the political class and the general public was key to the Big Air Force concept taking hold and thriving as part of the \$5 billion, three-year defence programme announced in February 1951. (See **Tables 5-4 and 5-5**). Initial manpower expansion favoured the Canadian Army as a result of the UN commitments in Korea and NATO in West Germany. RCAF manpower expansion began in earnest during 1951-52, but it was only with the completion of the

¹⁷² DHH 73/1223, Series 1, File 89, "Reassessment of the Risk," 29 October 1952, Memorandum from Chairman, Chiefs of Staff to Minister of National Defence. For an unclassified view of the situation, see Field Marshal Viscount Montgomery, "A Look Through a Window at World War III," (originally published in the *Royal United Services Institute Journal*), reprinted in *The Roundel*, Vol. 7, No. 5, May 1955. Also see Marshal of the RAF Lord Tedder, "The Shape of Wars to Come," (originally published in *Air Power* – Tedder was addressing the Air League in October 1953), reprinted in *The Roundel*, Vol. 6, No. 8, September 1954.

initial expansion in 1954, and the end of the Korean War, that RCAF manpower as a percentage of the total armed services began to creep upwards. In 1955, the RCAF attained parity in size with the Canadian Army, and the following year the RCAF emerged as the largest service, a position it was to hold until the end of the Cold War. The RCAF increased by twenty-five per cent in the first year of the Korean War 1950-51 (compared to sixty per cent for the Canadian Army). However, with the February 1951 programme, the RCAF more than doubled in size by 1954. By December 1956, RCAF manpower had tripled in size compared to its 31 March 1950 strength, with 50,540 personnel out of armed services total strength of 117,177 personnel.

The Reserve components underwent a similar expansion, including the RCAF Auxiliary Force, though its rate of growth was not as great as the Regular Force. In the first year of the Korean War, the increase in the strength of the Auxiliary mirrored that of the Regular Force at twenty-six per cent. However, during the subsequent 1951-54 expansion, the Auxiliary Force growth rate was three-quarters of that of the Regular Force. The Auxiliary achieved the peak of its post-war manpower in March 1953 with 5,874 personnel, and then slightly declined to 5,600 officers and airmen by December 1956. The ratio between Regular and Auxiliary RCAF personnel gradually changed to favour the Regular Force. In 1950, the Auxiliary strength was fourteen per cent of that of the Regular Force, peaking at 14.7 per cent in 1952. By 1954 the percentage had decreased to less than twelve per cent, and eleven per cent in 1955 and afterwards.

Given the proximity of the end of the Second World War, in 1951 there were literally tens of thousands of former RCAF members available to re-join either the Regular RCAF or the Auxiliary. With their recent experience, many former members required only refresher training

to ensure their immediate employment in the RCAF as opposed to new entries who required at least a year's worth of training before posting to an operational unit.

The expansion programme further increased the RCAF "footprint in the community" with the re-opening of numerous airfields and stations, and the expansion of existing stations. The RCAF "footprint" also included University Reserve Training Plan candidates attending civilian universities, the Royal Canadian Air Cadets' officer instructors and the cadets, the DND civilian employees at RCAF stations and units, RCAF veterans, Ground Observer Corps volunteers, and the thousands employed in the Canadian aircraft industry and their suppliers. In total, these various groups and their families would have encompassed approximately two million Canadians out of a total population of fourteen million.

However, even as this three year, \$5 billion expansion programme got underway, there were fiscal constraints.¹⁷³ An early example of this fiscal reality was Claxton's rejection of a second air division of light bombers assigned to SACEUR. There were later decisions not to equip Auxiliary squadrons with *CF-100* fighters or expand the number of Regular squadrons in Air Defence Command. The 1951 defence programme was neither sustainable for the long term, nor was this long-term support the intent of the government, in reacting to the crises of 1949-50. Thus defence spending began to decline in the late 1950s.

The DND budget illustrated the steady increase focused on the Big Air Force concept (See **Table 5-6**). In 1950, the RCAF share of the DND budget amount to thirty-six per cent. During the first year of the Korean War with the emphasis on the Canadian Army, the RCAF share declined to thirty per cent. Starting the following year, 1951-52, the expansion

¹⁷³ DHH 73/1223, Series 3, File 1307A, Chiefs of Staff Committee, Special Meeting, 15 January 1952. Economies were relatively easy to attain, as the DND budget was underspent for all three Fiscal Years 51/52, 52/53 and 53/54 in the expansion programme.

programme increased the RCAF share to forty-six per cent, followed with forty-nine per cent in 1952-53 and fifty-one per cent in 1953-54. Commencing in 1954-55, the RCAF budget share of the DND budget remained in the fifty per cent range until the mid 1960s.¹⁷⁴

RCAF manpower was another area where potential economies were ignored in the rush to build up. Though the RCAF tripled in size over six years, there was a considerable amount of wastage with recruit intakes that was more noticeable in the later years of expansion (See **Table 5-7**). Over the period of the three-year expansion programme, manpower wastage increased from eighteen per cent in 1951-52, to thirty-four per cent in 1952-53, and to fifty per cent in 1953-54. Total enlistments in the RCAF during this period were 34,841, with a net increase in RCAF manpower of 25,397. Though there are no clear reasons for the increase in the wastage rate, it is suggested that the rate was lower in 1951-52 due to the recruitment of thousands of RCAF veterans, the so-called “retreads.” Despite what appears to be significant wastage rates in the RCAF, both the Canadian Army and RCN experienced much higher wastage rates.¹⁷⁵ The lower RCAF rate might be attributed to higher educational standards demanded of RCAF recruits, better selection and hence better quality of recruits, and the high costs of RCAF training that would have provided a greater incentive and support for the training system in wanting recruits to succeed.

The organizational structure of the RCAF also played a part in the inefficient use of manpower, particularly as noted with the Tactical Air Command. In addition, support to the Auxiliary flying squadrons absorbed a significant number of RCAF Regular personnel. Within Air Defence Command, the perhaps too rapid establishment of the various Aircraft Control and

¹⁷⁴ The 1956-57 defence economies reduced the RCAF share of the defence budget for that year to 46 per cent.

¹⁷⁵ Canadian Army wastage rates 1951-52, 36 per cent, 1952-53 – 111 per cent (wastage exceeded enlistments) and 1953-54 – 85 per cent, while wastage for the RCN was 1951-52 – 36 per cent, 1952-53 – 44 per cent, and 1953-54 – 60 per cent (Brooke Claxton, *Canada's Defence Programme, 1954-55*, Ottawa: Queen's Printer, 1954).

Warning squadrons and their stations on the *Pinetree Line* absorbed a considerable number of RCAF personnel who might have been better employed elsewhere, as some of the stations had a very short lifespan as additional unmanned radar lines were constructed to the north of the *Pinetree Line*. The RCAF Auxiliary peaked at approximately one-third of its original proposed strength. There was an initial interest by many Second World War RCAF veterans, along with the infusion of new entries. However, once the decision had been made to eliminate the Auxiliary fighter and bomber squadrons and convert them into light transport squadrons, interest began to wane. Further, the non-flying units (except for the Aircraft Control and Warning squadrons) did not have an operational role. This made them an easy target for reductions in the late 1950s. In the case of the Auxiliary Aircraft Control and Warning squadrons, it was the modern technology in the form of SAGE in NORAD that accelerated their demise and ultimate disbandment.

By the mid 1950s, the Big Air Force concept for the RCAF remained a firm vision among its proponents. However, there were some unsettling developments. The idea of independent roles for the RCAF was based on strategic air defence, the NATO air contribution and the NATO air training role. These roles were undergoing change at this juncture, resulting in uncertainty about their future. In addition, there was deep disagreement over the roles of support to the Canadian Army and the RCN. The RCAF saw no need for Tactical Air Command, but the Canadian Army was pursuing plans to develop its own significant Army Aviation element. In the case of Maritime Air Command, there was the issue “everything that flies” being controlled by the Air Force that was strongly contested by the RCN, leaving the matter of the need and rationale for two “maritime air forces” unresolved. Air Transport Command had demonstrated its importance in the conduct of air operations for support to the

UN in Korea and Suez, but also in support to the other Commands for routine operations, including Tactical Air Command in the MSF role. Air Transport Command was promised new aircraft, but not at the expense of new fighters as evidenced by the reduction in the *Yukon* procurement. This myriad of flying activities conducted by the RCAF and the other services exacerbated this ongoing conflict between the two competing visions of air power – “Douhet with nukes” versus Mitchell’s “anything that flies.” The diminished importance of the Auxiliary Force by the late 1950s added to the developing uncertainty associated with the Big Air Force.

By 1957, it was recognized that the build up of the RCAF that had begun under the perceived threat of imminent war in the early 1950s needed to be re-examined. The strategic situation had changed, along with the technology associated with that strategic environment, including the RCAF focus on strategic air defence. Within this context, the operative expression was “uncertainty.” New equipment projects, the Avro *Arrow* interceptor, the *Argus* maritime patrol aircraft and the *Yukon* strategic transport were under development and expected to soon replace existing aircraft in service. Fiscal realities had already resulted in defence reductions; in the case of the RCAF, it was the Auxiliary that bore significant cutbacks. Attaining victory in the 10 June 1957 Federal election, John Diefenbaker’s Progressive Conservatives replaced the long reigning Liberal government of 22 years – a new chapter in the Big Air Force concept was about to commence.

Table 5-4 - RCAF Personnel Strength: 1950-56**Regular Force**

Date	Officers	Other Ranks	Total
31 Mar 50	3,143	14,131	17,274
31 Mar 51	4,357	18,002	22,359
31 Mar 52	6,820	25,791	32,611
31 Mar 53	8,071	32,352	40,423
31 Mar 54	8,300	37,296	45,596
31 Mar 55	8,984	40,477	49,461
31 Mar 56	9,681	40,308	49,989
31 Dec 56	10,105	40,435	50, 540

Auxiliary Force

31 Mar 50	636	1,733	2,369
31 Mar 51	808	2,399	3,207
31 Mar 52	1,325	3,485	4,810
31 Mar 53	1,647	4,227	5,874
31 Mar 54	1,807	3,633	5,440
31 Mar 55	1,908	3,479	5,387
31 Mar 56	1,937	3,585	5,522
31 Dec 56	1,958	3,642	5,600

Table 5-5 - Canadian Armed Services (Regular Force) Strength – 1950-56

Year	RCN	Canadian Army	RCAF	Total (RCAF %)
31 Mar 50	9,259	20,652	17, 274	47,185 (37%)
31 Mar 51	11,082	34,986	22,359	68,427 (33%)
31 Mar 52	13,505	49,278	32,611	95,394 (34%)
31 Mar 53	15,546	48,458	40,423	104,427 (38%)
31 Mar 54	16,955	49,978	45,596	112, 529 (41%)
31 Mar 55	19,207	49,409	49,461	118,077 (42%)
31 Mar 56	19,116	47,573	49,989	116,6783 (43%)
31 Dec 56	19,005	47,632	50,540	117,177 (43%)

Table 5-6 - Defence Expenditures According to Service: 1949-1958 (Millions of Dollars)

Year	RCN	Canadian Army	RCAF	Total *(RCAF %)
1949-50	74	136	137	385 (36%)
1950-51	100	212	231	782 (30%)
1951-52	183	474	651	1,416 (46%)
1952-53	261	504	913	1,882 (49%)
1953-54	290	437	915	1,805 (51%)
1954-55	305	455	815	1,665 (49%)
1955-56	341	462	799	1,750 (46%)
1956-57	327	460	864	1,775 (49%)
1957-58	295	425	814	

* Total includes Defence Research Board and Mutual Aid.

Table 5-7 - Regular RCAF Growth: 1951-54 – Enlistments/Wastage/Net Increase/Strength

1950-51

RCAF Strength 31 March 1951 – 22, 359

1951-52

Enlistments – 12,651

Wastage – 2,339 (18%)

Net Increase – 10,252

RCAF Strength 31 March 1952 – 32,611

1952-53

Enlistments – 11,825

Wastage – 4,013 (34%)

Net Increase – 7,812

RCAF Strength 31 March 1953 – 40,423

1953-54

Enlistments – 10, 365

Wastage – 5,192 (50%)

Net Increase – 5,173

RCAF Strength 31 March 1954 – 45,596

Totals 1951-52 to 1953-54

Enlistments – 34,841

Wastage – 9,444 (27%)

Net Increase – 25, 397

Chapter 6

Canadian Air Power and the “Defence Debacle” – 1957-1963

Introduction

As the Diefenbaker government assumed power in 1957, there were already undercurrents of strategic uncertainty and pressures for defence economies. Yet the need to re-equip the RCAF was paramount, the more so because the new government cancelled the costly Avro *CF-105 Arrow* programme, a grievous blow to the domestic aviation industry, even as new aircraft types capable of delivering nuclear weapons were needed. The RCAF turned to American designs, the McDonnell *CF-101 Voodoo* and the Boeing *BOMARC* surface-to-air missile for Air Defence Command, and the Lockheed *CF-104 Starfighter* for No. 1 Air Division in Europe. The RCAF’s achievement was to create a modern nuclear capable air force, but did so in growing chaos as the government divided over the acquisition of nuclear weapons.

In the midst of this bitter debate, the service made progress in other areas. The introduction of the *Argus* maritime patrol aircraft resulted in a tremendous increase in the capability of Maritime Air Command that attained its peak growth during this period. Air Transport Command was also partially re-equipped, gaining increased importance particularly with its involvement in United Nations operations, both in the Middle East and Congo. These undertakings produced tepid acknowledgement among the air staff that there was the possibility of increased involvement of conventional air power in so called “brushfire wars,” including peacekeeping under the United Nations. More robust support for such a future force structure – an alternative to the nuclear air force – came from the 1962 report of the Special Studies Group on Long Range Objectives for the RCAF, the subject of the final part of the present chapter.

Throughout the period from 1957 to 1963, there was the continual friction from the three pillars of politics and economics, strategy and technology. Political indecision and tight fiscal constraints on the part of the Diefenbaker were unable to come to terms with the profound changes in strategy and technology.

The Diefenbaker Years 1957-63

The new MND, George Pearkes, like his Liberal predecessors, Brooke Claxton and Ralph Campney, was a First World War veteran. However, Pearkes had also been a professional soldier who served in the Canadian Army until 1945, retiring as a Major General; he had been the wartime commander of the Pacific Command. Elected to the House of Commons in 1945, Pearkes had been the Official Opposition defence critic. Unlike his fellow Army generals such as Simonds, Pearkes was an avid supporter of air power. Pearkes' term as Defence Minister was to be short (he left his post in 1960), but the decisions by the government during his tenure were to have a tremendous effect on the RCAF during the remainder of the Progressive Conservative government and the subsequent Liberal government.¹

Air Marshal C.R. Selmon's replacement as CAS, on 1 September 1957, was Air Marshal Hugh Campbell, who had risen to prominence during the Second World War as the Director of Training (Plans) at AFHQ becoming heavily involved in establishing the BCATP. Subsequently, he served overseas starting in 1942 as the Director of Air Staff at RCAF HQ Overseas, returning to AFHQ in January 1944, first as the assistant to the CAS, and then becoming the Air Member

¹ Pearkes' more obscure successor, Douglas Harkness, Minister of National Defence, 1960-63, had to contend with these issues.

for Personnel in April 1945.² During the post-war period, Campbell served as the first AOC of No. 1 Air Division and subsequently as the Vice Air Deputy and then Deputy Chief of Staff Operations at SHAPE.³ During his tenure as CAS from 1957 to 1962 Campbell was to oversee the extensive transformation of the RCAF in the face of extraordinary challenges.

Defence Economies 1957-58

During the last few years of the St. Laurent Liberal government, there had been an acknowledgement that the intense defence effort could not be sustained. The budget by the outgoing Liberals for 1957-8 included a \$128 million decrease for capital equipment and construction. At the same time the reduced budget had to absorb \$71 million in additional expenditures for personnel and operating costs due to salary increases, higher prices for goods and services, and the entry into service of new radar installations.⁴ The newly elected Progressive Conservative government, demanded further economies, and this became an intense staff activity during the summer of 1957 with the aim of reducing defence expenditures from \$1.723 billion in 1957-58 to \$1.5 billion for 1958-59, a 12.5 percent cut.⁵ This would have meant a budget reduction of seventeen per cent for the RCAF in the space of a single fiscal year.⁶ However, to soften the impact of reductions, the government instead spread the defence cuts over a period of years with \$78 million for the current fiscal year, 1957-58 and \$111 million for 1958-59. Rather than the RCAF budget being reduced from \$869 million in 1957-58 to \$740 million

² "Change of Command," *The Roundel*, Vol. 10, No. 2, March 1958.

³ "AM Hugh Campbell Retires as CAS," *The News and Eastern Townships Advocate*, St John, P.Q., 17 May 1962. <http://news.google.com/newspapers?id=wBUAAA1BAJ&sjid=0CoDAAA1BAJ7pg=1918%2C3902007> [accessed 28 January 2015].

⁴ Ralph Campney, *Report on National Defence*, Ottawa: Queen's Printer, 1957, pp. 38-39.

⁵ DHH 73/1223, Box 10, File 159, Office of the Chairman Chiefs of Staff – Reduction of Defence Estimates, 16 August 1957.

⁶ *Ibid.*

in 1958-59, the actual reduction was from \$813 million to \$787 million, representing less than four per cent.

Table 6-1 RCAF Budget – Operations & Maintenance and Capital Expenditures Comparison					
Ref: Chart 4 to Appendix C to Comptroller’s Address to 1964 AOC Conference (Air Vice Marshal VSJ Millard) ⁷					
Fiscal Year	O&M \$	Capital \$	Total \$	O&M Ratio %	Capital Ratio %
1953/54	344	571	915	37.6	62.4
1954/55	393	422	815	46.2	51.8
1955/56	441	357	798	55.3	44.7
1956/57	515	348	863	59.7	40.3
1957/58	536	277	814	65.9	34.1
1958/59	517	281	797	64.8	35.2
1959/60	511	232	743	68.8	31.2
1960/61	514	241	755	68.1	31.9
1961/62	515	273	788	65.4	34.6
1962/63	521	194	715	72.8	27.2
1963/64	557	128	685	81.3	18.7
1964/65	541	115	656	82.5	17.5

The RCAF reductions proposed in the summer of 1957 included the close-out of facilities at Suffield, Churchill, Whitehorse, Goose Bay, Sea Island (Vancouver), Claresholm, the

⁷ DHH 73/1223, File 2000, AOC Conference, 14-16 April 1964. See also Ernie Hemphill, “Better Management Stretches Defence Dollar,” *Canadian Aviation*, Vol. 35, No. 2, February 1962.

discontinuation of refresher flying training, a two-thirds reduction in the University Reserve Training Plan, the disbandment of the Auxiliary flying squadrons, cancellation of aircrew training for Norway, Holland and Denmark, and the disbandment of a wing in No. 1 Air Division or a reduction in aircraft per squadron, from eighteen to twelve *CF-100s* and from twenty-five to eighteen *Sabre* aircraft.⁸ These proposed reductions amounted to total savings of \$55 million, including \$13 million for disbanding the Auxiliary squadrons, \$8 million for NATO aircrew training, and \$20-22 million for Air Division reductions.⁹ As a result of the government's easing of the cuts, the reductions proposed for the Air Division and NATO aircrew training were not carried out. Neither was the disbandment of the Auxiliary flying squadrons, though the fighter and bomber roles were eliminated and the remaining eleven squadrons assumed a light transport role using the *Expeditor* aircraft. The Auxiliary Force non-flying activities such as Intelligence and Technical Training Units were also eliminated. Some installations were closed, but not Sea Island and Goose Bay.¹⁰

Capital equipment reductions were to have more a far-reaching impact on the Big Air Force. Proposed cancellations included the *CF-100 Mk. 6* fighter armed with the *Sparrow II* air-to-air missile (\$54 million), the *Sidewinder* air-to-air missile for the *Sabre* fighters (\$8 million), the *Albatross* search and rescue aircraft (\$14 million), and the *Cosmopolitan* medium transport (\$5 million). In addition, procurement of the *Argus* maritime patrol aircraft would be reduced from fifty to twenty-five (\$18 million).

⁸ DHH 73/1223, Box 10, File 159, Office of the Chairman Chiefs of Staff – Reduction of Defence Estimates, 16 August 1957.

⁹ Ibid.

¹⁰ Sea Island remained open to support the two Auxiliary squadrons finally closing 31 March 1964 when the squadrons were disbanded. The government is still trying to close-out Goose Bay.

Both the *CF-100 Mk. 6* and the *Sidewinder* missile programmes were cancelled. The *CF-100 Mk. 6* had been intended to equip four squadrons in Air Defence Command between May 1958 and June 1959, significantly improving its capabilities with missile-armed aircraft, and providing a stopgap solution in the event of delays in the Avro *Arrow* that was scheduled to enter squadron service in June 1961.¹¹ The *Sidewinder* missile was to equip the eight *Sabre* squadrons in the Air Division that would have improved their capability, prolonged their front-line service, and thus delayed the need to replace them with a more modern type.

In the end thirty-three *Argus* aircraft entered service, but the shortfall from the fifty originally planned meant that the *Neptune* “interim” aircraft had to be retained. In the case of the *CC-106 Yukon* strategic transport, eight aircraft were to be delivered by February 1961, with another sixteen to follow by September 1963 to replace the remaining *North Star* transports. However, *Yukon* procurement ceased with the delivery of only twelve aircraft. Acquisition of the Grumman *CSR-110 Albatross*, intended to replace the wartime *Canso* amphibian aircraft, was limited to ten rather than the twenty-four aircraft, while the full order for ten *CC-109 Cosmopolitan* transports was completed; this contract helped Canadair in view of the reductions in their contracts for the *Argus* and *Yukon*.

The decline in the RCAF budget was more than thirty percent between the years 1953/54 and 1964/65. These cuts were somewhat larger than those absorbed by the Army and the Navy. In 1953/54, the RCAF share of allocations for the three services amounted was fifty-six per cent, and by 1964/65 it had dropped to forty-seven percent.¹²

¹¹ *CF-100 Mk. 6* aircraft were to consist of seventy-five new production and sixty-seven retrofitted *CF-100 Mk.5*.

¹² During the Diefenbaker years, the RCAF continued to receive over 50 per cent of the DND budget allocated to the three services: 1958-59 – 53 per cent, 1959-60 – 53 per cent, 1960-61 – 54 per cent, 1961-62 – 52 per cent, and

Air Defence Command Re-equipment 1957-62

An examination of the significant political and military decision milestones during the St. Laurent years shows that the Avro *CF-105 Arrow* programme had gone awry under the Liberal administration. Initial discussion of a replacement for the *CF-100* took place on 21 June 1950 when Air Vice Marshal A.L. James, the Air Member Technical Services briefed the air staff on the proposal for a supersonic fighter to be produced in the next ten years.¹³ A joint team was established to determine the Canadian specifications and study US and UK developments.¹⁴ The original requirement had called for a single-engine, single-seat aircraft of 30,000 pounds, but this was revised to a two-seat, two-engine all weather aircraft of 50,000 pounds with a speed of Mach 1.5 and capable of operating at 60,000 feet.¹⁵ The Chiefs of Staff Committee Meeting on 25 November 1953 recommended that the government proceed with the *CF-105* programme to meet the requirement for all-weather interceptor capable of countering the jet bomber in the time period from 1957 onward. The chiefs noted there was no aircraft under development in the US or the UK that met the Canadian needs. Major General Sparling, the Acting Chief of the General Staff, expressed his concern that the programme would be financed from the RCAF estimates with a corresponding negative impact on the remainder of the DND budget. In response, the CAS, Air Marshal Slemon stated, “the RCAF would endeavour to finance the planned programs from within its financial allocations. However, it was not possible to anticipate fully all expenditures.”¹⁶ On 17 December 1953, the Cabinet Defence Committee approved the

1962-63 – 50 per cent [Department of Finance, Public Accounts] cited as Table VI in John W. Warnock, *Partner to Behemoth: The Military Policy of a Satellite Canada*, Toronto: New Press, 1970, p. 324.

¹³ DHH 73/1223, File 1826, Minutes of the 108th Meeting of Air Members, 21 June 1950 and File 1822, Minutes of the 135th Meeting of the Air Members, 19 September 1951.

¹⁴ *Ibid.* The joint team consisted of RCAF, Defence Research Board, National Research Council and A.V. Roe representatives.

¹⁵ DDH 73/1223, File 1824, Minutes of the 178th Meeting of Air Members, 7 July 1953.

¹⁶ *Ibid.*

development of the Avro *CF-105 Arrow* at a cost of approximately \$27 million, including the development of two prototype aircraft but only the airframe. Other major components – the engine, the fire control radar, and the weapons systems -- were to be procured as off-the-shelf items from other companies.¹⁷ The total requirement involved up to 600 *Arrow* aircraft to equip the nineteen squadrons in Air Defence Command, an Operational Training Unit, and provide maintenance spares and offset attrition.¹⁸ The unit cost was estimated at \$1.5-\$2 million per aircraft at a time when the current production cost for the Canadair *Sabre* was \$500,000 per aircraft and \$1 million for the *CF-100* per aircraft.¹⁹

The next milestone occurred in March 1955 when Ralph Campney, the MND requested the accelerated development of the *Arrow* reflecting the earlier than expected emergence of Soviet long-range thermonuclear armed bombers. To speed up the process, a new development and production procedure would be introduced requiring \$191 million for forty *Arrow* pre-production aircraft based on eleven aircraft for contractor testing and twenty-one aircraft for RCAF testing and attrition spares for the period from 1954/55 to 1959/60.²⁰ Rather than the traditional method of using two prototypes, the use of these eleven aircraft would reduce Avro

¹⁷ DHH 73/1223, File 1328, Cabinet Defence Committee, Memorandum, 5 February 1954, Cabinet Conclusions of 17 December 1953. It was recognized that an engine would have to be developed at a later date. In the original design, the Rolls-Royce *RB-106* engine was the intended power plant, but this project was cancelled. The next alternative was the Pratt and Whitney *J75*, the engine that powered the pre-production aircraft that were flown. As a private venture, Orenda developed the *PS-13 Iroquois* that was selected for the aircraft. The *Iroquois* was flown on a *B-47* bomber test bed, but not on the Avro *Arrow Mk. 2* aircraft before the programme's cancellation.

¹⁸ The Avro *Arrow* was intended to replace the *CF-100* interceptor for the twenty-one home-based RCAF Regular and Auxiliary squadrons each with a proposed establishment of eighteen aircraft per squadron. However, by 1955 it was decided that the *CF-100* was too complex an aircraft to be operated by Auxiliary squadrons, so they were never equipped with the *CF-100*.

¹⁹ See "Is the Price Too High?" *Canadian Aviation*, Vol. 25, No. 4, April 1952. Despite the experience with the *Sabre* air superiority fighter in Korea, there was a pronounced tendency for Western air forces to proceed with the development of heavier and more complex long-range fighters – and hence more expensive aircraft. See Robert Jackson, *Cold War Combat Prototypes*, Chapter 11, "The Heavy Brigade: Long-Range Fighters."

²⁰ This was the Cook-Craigie Plan that greatly reduced the design and testing stages of the aircraft's flying development, eliminating the need for a large number of prototypes. It made for low risk aircraft projects, but it was a questionable approach to *CF-105 Arrow* project development. See Elliott V. Converse III, *Rearming for the Cold War 1945-1960*, Washington: Historical Office – Office of the Secretary of Defense, 2012, pp. 477-478.

Canada's testing period from 8½ years to 2¼ years. Similarly, the use of the twenty-one aircraft for service testing would allow for "fully operational aircraft to be available to squadrons within 3 to 3½ years after completion of the first preproduction aircraft."²¹ The requests for the aircraft and the development of fourteen *PS-13 Iroquois* engines at a cost of \$70 million were approved, with costs being met within the existing defence budget.²² There was the proviso attached to the approval, "the programme for both the airframe and the engine could be halted or abandoned at appropriate stages if this was found to be expedient or necessary."²³ The cost of the aircraft now increased to an estimated at \$2.5-\$3 million while production might range from 100 to 500 aircraft, the higher estimate being based on the *Arrow* re-equipping the Air Division as well as Air Defence Command.²⁴ The total amount allocated to the *Arrow*'s development was now \$280 million allowing the programme to continue until 1960.²⁵

Six months later, at the Cabinet Defence Committee on 27 September 1955, Campney noted that Avro Canada had re-assessed its costs thus increasing the total programme to \$340 million.²⁶ Campney requested a re-appraisal of the programme, a re-appraisal that was conducted by a government-wide panel.²⁷ As a result, at the 7 December 1955 meeting, the Cabinet agreed to a reduction to the *Arrow* programme that had been previously approved at the 3 March 1955

²¹ DHH 73/1223, Series 1, File 128, RCAF Equipment Policy, Minister of National Defence, Appendix "A" to Cabinet Defence Submission, S10338CF105 – 180, 25 February 1955, Preproduction Program for Supersonic Fighter Aircraft (CF-105).

²² DHH 73/1223, File 1329, Cabinet Defence Committee, Minutes of the 104th Meeting, 3 March 1955. In the meantime, aircraft development would utilize the Pratt and Whitney *J75* engine. Interestingly, the project was to be budgeted within proposed defence expenditures that did not consider the possibility for reductions. At the meeting, the view had been expressed that it was highly doubtful that the US would purchase the *CF-105* and this proved to be result with the meeting between the MND and the US Secretary of the Air Force.

²³ Ibid.

²⁴ Ibid.

²⁵ DHH 73/1223, Series 1, File 632, CF-105 Aircraft – Appendix "A" to Report on the Development of the CF-105 Aircraft and Associated Weapon System 1952-1958.

²⁶ This included the development costs of the *Iroquois* engine and *Sparrow II* missile.

²⁷ DHH 73/1223, File 1329, Cabinet Defence Committee, Minutes of the 108th Meeting, 17 November 1955. The panel consisted of the CAS as chairman, along with the Deputy Minister, DND, the Chairman, DRB, Deputy Minister, DDP, and representatives from the Cabinet Secretariat, Departments of Finance, External Affairs and the National Research Council.

meeting.²⁸ The programme was revised to allow for the procurement of eleven aircraft, including airframe and engines, at a cost of \$170 million to be spread over three fiscal years.²⁹ A further programme revision in February 1957 reduced the number to eight development aircraft albeit with an increased budget to \$217 million extended to the end of FY 1957-58, with the cost of integrating the RCA *Astra* fire control system accounting for most of the increase.³⁰ The remaining twenty-nine preproduction aircraft would not have to be ordered until FY 1958-59 while the estimated cost to complete the thirty-seven aircraft programme was now pegged at \$500-600 million.³¹ This was the last Cabinet Defence Committee meeting held by the St. Laurent government at which the *Arrow* programme was discussed prior to the June 1957 general election.

Further cost increases in the summer of 1957 to integrate the *Sparrow II* missile with the *Astra* fire control radar prompted the Air Staff to conduct another review.³² At a special meeting on financial aspects of the *Arrow* held on 21 August 1957, the Vice Chief of the Air Staff, Air Vice Marshal C.R. Dunlap, noted that the RCAF spent \$300 million annually on Operations and Maintenance and that no single aspect of the RCAF programme was “over emphasized.”³³ Air Commodore C.L. Annis, Chief of Telecommunications, commented, “that he had some serious

²⁸ DHH 73/1223, File 1329, Cabinet Defence Committee, Minutes of the 108th Meeting, 17 November 1955.

²⁹ DHH 73/1223, File 1329, Cabinet Defence Committee, Record of Cabinet Decision, 7 December 1955. The breakdown of the \$170 million was \$114 million allocated to the airframes and \$56 million allocated for the engines.

³⁰ DHH 73/1223, Series 1, File 632, CF-105 Aircraft – Appendix “A” to Report on the Development of the CF-105 Aircraft and Associated Weapon System 1952-1958. This was the 113th Cabinet Defence Committee meeting 6-7 February 1957.

³¹ Ibid.

³² DHH 73/1223, File 1827, Air Council, Aide-Memoire of a Discussion Held the CAS Conference Room, 24 July 1957. The cost of integrating the *Sparrow II* missile with *Astra* had increased from \$65 million in December 1955 to \$126 million in July 1957, challenging the efficacy of continuing with the *Sparrow II* missile project. It was feared that *Sparrow II* development would cease development if the *CF-100 Mk. 6* missile-armed aircraft were cancelled, thus depriving the *Arrow* of its preferred weapon. The *CF-100 Mk. 6* was cancelled, but the *Sparrow II* remained part of the programme. A conundrum had now emerged that the inherent limitations of the *Sparrow II* would not allow for the full capability of the *Arrow* to be realized

³³ DHH 73/1223, File 1827, Air Council, A Special Meeting Held in the Office of the CAS, 21 August 1957.

doubts that the Air Force could actually afford the *Arrow* Programme, and at the same time discharge its other commitments.”³⁴ Air Marshal Slemon, the CAS, noted that the original decision to proceed with the project was a sound one, but in light of the current *Arrow* costs and other RCAF programmes, “viewed realistically the RCAF could not proceed with the *Arrow* programme alone.”³⁵ Dunlap was concerned how the *Arrow* would impinge upon other programmes such as radar improvements, the *BOMARC* surface-to-air missile, and the ground environment system. He “felt that since *BOMARC* was considered more much important than the *Arrow*, the Air Force must...have *BOMARC* with the ground environment and the aircraft to support it.”³⁶ As a result of this meeting, it was agreed that representation be made to the US for joint participation in the Avro *Arrow* programme, that alternatives to the *Arrow* be considered along with the costs, and the RCAF wait until the new government detailed its perspectives on the Defence Programme.³⁷

A Cabinet Defence Committee meeting on 19-20 September 1957 approved the cancellation of the *Sparrow II* missile equipped *CF-100 Mk. 6* and the disbandment of the Auxiliary fighter squadrons. Though an earlier decision had been made not to equip these squadrons with the *CF-100*, their disbandment confirmed that the maximum requirement would not exceed 169 *Arrow* interceptors. The aircraft was finally publicly unveiled on 4 October 1957, with the RCAF finally establishing that same month a dedicated project office to manage the *Arrow* programme.

³⁴ Ibid.

³⁵ Ibid. Given the integration of North American air defence, Slemon suggested that the US be approached with the notion of introducing the Avro *Arrow* as common weapon with costs to be shared between Canada and the US. However, Slemon went on to state that if the US did not accept this proposal, “...then the Air Force should be prepared to tell the Government that the *Arrow* Programme was too costly for Canada to continue alone.”

³⁶ Ibid.

³⁷ Ibid.

An Air Council meeting on 15 October 1957 focused its discussion on the need for the *Arrow*: would there be a manned bomber threat to North America from 1961-62 onward; was a manned interceptor needed to deal with this threat; and, if a manned interceptor was required, should it be the *Arrow* or another aircraft?³⁸ The general consensus concluded that the manned interceptor and the surface-to-air missile were complementary weapons systems, and that both weapons would be required for a Canadian air defence system.³⁹

On 29 October 1957, the Cabinet Defence Committee authorized a twelve month continuation of the development programme to include the procurement of the additional twenty-nine preproduction aircraft, acceleration of the *Iroquois* engine development, and the continuation of the *Sparrow II* missile programme. Although the government decision did not imply approval for the total \$646 million programme cost, the draft submission to the Cabinet Defence Committee did note the previously authorized \$216 million to 31 March 1958, along with the estimate that the thirty-seven preproduction aircraft programme would cost \$646 million.⁴⁰

The first flight of the *Arrow* occurred on 25 March 1958, but it was during the summer of 1958 that the *Arrow*'s fate was determined. The Chiefs of Staff Committee agreed at their meeting on 10 June 1958 that authority would be sought for the continued production of the thirty-seven *Arrow* pre-production aircraft. In July, however, Lieutenant General Graham, the Chief of the General Staff, who had been absent from that June meeting, wrote to the Chairman, General Foulkes, noting the absence of a response to Graham's earlier request for a general

³⁸ DHH 73/1223, File 1827, Air Council, Minutes of the 271st Meeting of the Air Council, 15 October 1957. Compared to the latest US fighter under development, the *F-106A*, the Avro *Arrow* was considered the superior aircraft.

³⁹ Ibid.

⁴⁰ DHH 73/1223, Series 1, File 632, CF-105 Aircraft – Appendix "A" to Report on the Development of the CF-105 Aircraft and Associated Weapon System 1952-1958.

review of air defence and specifically the *Arrow* programme.⁴¹ An ad hoc group examined the interceptor's financial impact on other RCAF programmes and the Army and the Navy. This was a key moment in the loss of support for the *Arrow*.⁴² At the Cabinet Defence Meeting on 15 August, Pearkes announced that he and the Chiefs of Staff Committee believed that the only recourse was to cancel the Arrow in favour of another aircraft. However, Prime Minister Diefenbaker demanded that the Chiefs of Staff Committee prepare a dossier on the history of the project, and this was presented at the Cabinet Defence Committee meeting on 21 August 1958 with the recommendation "consideration for cancellation."⁴³ However, at this meeting, the Cabinet Defence Committee did not make a decision on cancellation.⁴⁴

On 23 September 1958, the government announced the procurement of the Boeing *BOMARC* surface-to-air missile, the Semi Automatic Ground Environment (SAGE) system, and the gap-filler radars, along with the continued development of the *Arrow* until March 1959. In effect, the programme was ended on this date, because the government's direction was to focus on cost reduction, something that neither the government nor the RCAF believed could be achieved. The government finally announced cancellation of the *Arrow* programme on 20 February 1959.

⁴¹ Isinger, p. 80.

⁴² Ibid. At a Special Chiefs of Staff Committee meeting, there was the complete breakdown towards achieving an inter-service even intra-service (RCAF) consensus on the Arrow, either to continue the project in some form or to recommend its cancellation.

⁴³ DHH 73/1223, Series 1, File 632, CF-105 Aircraft – Appendix "A" to Report on the Development of the CF-105 Aircraft and Associated Weapon System 1952-1958. The Report included expenditures on the various components of the Avro *Arrow* – airframe, engine, Astra fire control system, and *Sparrow* air-to-air missile; resumé of *CF-105* development study of November 1955, the USAF appraisal of the *CF-105*, summary of Cabinet Decisions, Cabinet Defence Committee and Chiefs of Staff meetings, extracts from Hansard and discussions with the UK and US. See also Isinger and Denis Smith, *Rogue Tory*, p. 87.

⁴⁴ Isinger.

Over the fighter project's life, the requirement had steadily declined from 600 to 100 aircraft even as the estimated costs ballooned to something approaching \$1 billion.⁴⁵ If the project had adhered to its original scope, development of only the airframe, then it may have remained a viable programme, as suggested by Swedish experience.⁴⁶ The absence of effective oversight by both the Liberal and Progressive Conservative governments along with weak RCAF project control also contributed to the skyrocketing costs that killed the programme. Certainly political support for the Avro *Arrow* had become tenuous by 1957; the Liberals would have cancelled the programme if re-elected in that year.

The *Arrow* cancellation in February 1959 did not negate the requirement for a *CF-100* replacement.⁴⁷ Despite government rhetoric that the *BOMARC* selection represented the future of air defence, there was still a requirement for a modern fighter to undertake the peacetime interception and identification role, along with its wartime role of the initial air defence of the continent against attacking Soviet bombers. In the words of the CAS the RCAF still had "the need for an alternative interceptor – as opposed to alternatives to interceptors."⁴⁸ To replace the *CF-100*, the RCAF adopted the McDonnell *CF-101 Voodoo*.⁴⁹ The US originally proposed to

⁴⁵ Ibid. In the face of cancellation, the Canadian government had spent a total of \$470 million on the programme.

⁴⁶ Sweden continues to develop and produce advanced combat aircraft today. The SAAB *Draken* supersonic fighter, a contemporary of the *Arrow*, began its development in 1949, the prototype aircraft flying on 25 October 1955, and the initial version entering service in 1960. The *Draken* was progressively improved in subsequent versions remaining in production until 1972 by which time 550 aircraft had been produced for the Royal Swedish Air Force and 101 aircraft exported to Finland and Denmark. Though not as large as the *CF-105 Arrow*, the *Draken* was equally complex, but the Swedish aircraft was a successful programme with its focus only on airframe development, with the licensed production of the other major systems – engine, radar, and missile armament.

⁴⁷ See Brent Raycroft, "This and That on Air Defence," *Aircraft*, Vol. 22, No. 2, February 1960.

⁴⁸ Isinger, p. 83. See Ernie Hemphill and Peter Brannan, "Shelving the Arrow is Bad Military, Economic Medicine," *Canadian Aviation*, Vol. 31, No. 11, November 1958 and Brent Raycroft, "The Arrow Decision," *Aircraft*, Vol. 20, No. 11, November 1958. See also, Andrew Richter, *Avoiding Armageddon: Canadian Military Strategy and Nuclear Weapons 1950-63*, Vancouver: UBC Press, 2002, p. 52. "Campbell wrote [on 21 August 1958] that "I cannot associate myself with the decision to cancel the 105 programme but must recommend that it proceed as presently planned or, alternatively, to couple the cancellation of the 105 with the procurement of a supersonic interceptor to fill the gap."

⁴⁹ As an interceptor, the McDonnell *F-101 Voodoo* was inferior to the Avro *CF-105 Arrow*, but the RCAF did not have a choice because no other comparable type was available. Moreover, the *Voodoo* specifications fully met the

simply give the *CF-101* to the RCAF, but the Canadian government rejected this on the grounds that it would appear as having received foreign aid.⁵⁰ It was then proposed that the *CF-101* be provided on the basis of an exchange with the RCAF receiving the *Voodoo* and the USAF receiving the Canadair *CL-44* turboprop transport, along with Canada assuming responsibility for the sixteen *Pinetree Line* radar stations in Canada operated by the USAF. The Canadian government also rejected this proposal.⁵¹ The accepted proposal for obtaining the *CF-101* was based on the RCAF assuming responsibility for the *Pinetree Line* radar stations and paying \$50 million towards the licensed production of 140 *F-104G* aircraft by Canadair for the Military Assistance Program to equip other NATO air forces.⁵² In exchange the RCAF received sixty-six *CF-101* interceptors and Canadair received a \$200 million order for the *F-104G* aircraft.⁵³ The first *CF-101* was delivered in July 1961 and the remainder of the total sixty-six aircraft were delivered to the RCAF by May 1962.⁵⁴ The *CF-101* proved to be a reliable and safe aircraft in Canadian service.⁵⁵ In terms of the Big Air Force concept, the numbers of *CF-101* aircraft that were obtained to replace the *CF-100* represented a significant reduction in the strength of Air Defence Command. The nine *CF-100* squadrons with 162 aircraft (excluding the Operational Training Unit) were replaced with fifty-six *CF-101B* operational fighters and ten *CF-101F* operational combat-capable trainers equipping five squadrons in Air Defence Command, with all

requirements first identified for the *CF-100* replacement in 1953: a twin-engine, two-seat long-range interceptor capable of Mach 1.5+ equipped with air-to-air guided missiles.

⁵⁰ McLin, p. 103.

⁵¹ Ibid. p. 104.

⁵² Ibid. p. 105. See also "Voodoo/F-104 Deal Confirmed," *Canadian Aviation*, Vol. 34, No. 7, July 1961.

⁵³ Ibid.

⁵⁴ "The Voodoos Arrive," *Aircraft*, Vol. 23, No. 9, September 1961, "Voodoos with the RCAF," *Canadian Aviation*, Vol. 34, No. 10, October 1961, and "Five Squadrons get Voodoos," *Canadian Aviation*, Vol. 35, No. 6, June 1962. Some commentators have referred to this first batch of RCAF *Voodoos* as "second-hand" aircraft. In reality, though the *CF-101* aircraft delivered to the RCAF in 1961 were obtained from USAF holdings, these were still new aircraft.

⁵⁵ See R.E. Merrick, "McDonnell's Voodoo in Canadian Service," *CAHS Journal*, Vol. 28, No. 3, Fall 1990.

squadrons being declared operational 1 October 1962.⁵⁶ Initial armament for these aircraft was the *Falcon* conventional-armed air-to-air missile, but the *CF-101* aircraft acquired by the RCAF were capable of operating the *Genie* air-to-air nuclear rocket that was armed with a 1.5-kiloton warhead though the government proved to be indecisive in finalizing agreements with the US for the dual custody of nuclear weapons that would have made the *CF-101* aircraft more effective.⁵⁷

During the same period that the RCAF was re-equipping with the *CF-101 Voodoo*, the *BOMARC* was introduced into RCAF service.⁵⁸ The government had publicly announced the procurement of the *BOMARC* on 23 September 1958, however, plans to acquire the *BOMARC* had been considered by the RCAF for several years.⁵⁹ The *BOMARC* had commenced its development in 1950 when missiles were in their infancy, and as the decade progressed, it became part of the air defence debate regarding the efficacy of manned fighters versus missiles.⁶⁰ The initial version, the *BOMARC A*, powered by a liquid-fuelled rocket engine along with two ramjet engines, could be armed with either a conventional high explosive or nuclear warhead. The later *BOMARC B* was an improved version both in performance and range, powered by a

⁵⁶ The operational squadrons were No. 409 Squadron at Comox, No. 410 Squadron at Uplands, No. 414 Squadron at North Bay, No. 416 Squadron at Chatham, and No. 425 Squadron at Bagotville.

⁵⁷ See "Voodoo Conversion," *Aircraft*, Vol. 23, No. 8, August 1961. See also Bob McIntyre, *Canadian Profile CF-101 Voodoo*, Ottawa: Sabre Model Supplies Ltd Publishing, 1984. See John Clearwater, *Canadian Nuclear Weapons: The Untold Story of Canada's Cold War Arsenal*, Toronto: Dundurn Press, 1998, pp. 177-216, for details on the *Genie* rocket in Canadian service.

⁵⁸ The most complete story of the *BOMARC* in Canadian service is Robert H. Clark, *Canadian Weapons Acquisition: The Case of the BOMARC Missile*, Unpublished MA Thesis, Kingston: Royal Military College of Canada, 1983.

⁵⁹ DHH 73/1223, Series 1, File 89, Brief for Meeting of Consultation Continental Defence 2 December 1955. This briefing refers to "the introduction...sometime after 1962, of ground-to-air long-range guided missiles of the *BOMARC* type into the Canadian air defence system." (p. 10) See also DHH 73/1223, Series 3, Subseries 13. The inclusion of the *BOMARC* was also considered at the Special Meeting of the Air Members that discussed "Air Defence Problems – Long Range Implications" on 5, 8 and 14 September 1954.

⁶⁰ See Clayton K. S. Chun, "Winged Interceptor: Politics and Strategy in the Development of the Bomarc Missile," *Air Power History*, Vol. 45, No. 4, Winter 1998. By the late 1950s, there was an ongoing debate whether or not surface-to-air missile would replace manned interceptors. See, for example, "Evolution or Revolution," *Air Pictorial*, Vol. 19, No. 11, November 1957, James Hay Stevens, "Guided Missiles or Aircraft," *Air Pictorial*, Vol. 20, No. 4, April 1958, and Ronald Ivelaw-Chapman, "Missiles – and/or Aircraft," *Air Power*, Vol. 6, No. 1, October 1958.

solid fuel rocket engine and the two ramjet engines.⁶¹ Unlike the *BOMARC A*, the *BOMARC B* was armed only with a ten kiloton nuclear warhead.⁶² Base locations at North Bay, Ontario and La Macaza, Quebec were prepared to accommodate two new squadrons, each equipped with twenty-eight *BOMARC B* missiles. No. 446 Squadron formed at North Bay on 28 December 1961, followed by No. 447 Squadron at La Macaza on 15 September 1962, though neither squadron received its nuclear warheads. The introduction of the *BOMARC* missile squadrons was part of the air defence network modernization known as the CADIN (Continental Air Defence Integration North) programme including the implementation of the Semi-Automatic Ground System (SAGE), the installation of a number of new radar stations the modernization of the *Pinetree Line* radar, and the assumption by the RCAF of responsibility for the USAF operated *Pinetree Line* radar stations.⁶³

The changed nature of warfare brought about by the introduction of thermonuclear weapons had re-defined air defence. Devastation would have been immense if even a small number of attacking bombers successfully bombed North American cities. Air defence was now part of nuclear deterrence. The main purpose of the radar warning systems, interceptors, and surface-to-air missiles networked by the semi-automatic ground environment was to allow retaliatory forces to become airborne in order to survive an attack and deliver counter-attacks against the Soviets. The role of air defence changed from the protection of cities, populations, and industrial areas to that of defending the deterrent.⁶⁴

⁶¹ Peter Brannan, "Introducing the Boeing Bomarc," *Canadian Aviation*, Vol. 31, No. 12, December 1958.

⁶² Clearwater, p. 55.

⁶³ *The Roundel*, Vol. 13, No. 6, July-August 1961. See also D.S. Terrell, "What is SAGE?" *The Roundel*, Vol 13, No. 5, June 1961.

⁶⁴ See M. Lipton, "The Wisdom of Our Air Defence Policy," *The RCAF Staff College Journal*, 1956.

No. 1 Air Division Re-equipment 1957-63

No. 1 Air Division, comprising twelve squadrons equipped with 300 of the latest jet fighters, had been deployed to Europe between 1951 and 1954 to bolster NATO European air defences. No less important was the Air Division's political role in demonstrating Canadian commitment to the common defence and promoting the trans-Atlantic connection that was the essence of Western strength. By the mid-1950s, planning commenced to consider a replacement for the *Sabre* and *CF-100* fighters. Various inter-related factors had to be weighed in any decision to acquire new aircraft. First, there was the issue of the existing air defence role of the Air Division. Jon McLin described the situation:

At the time it was first sent to Europe...the air division helped fill a crucial gap in Western Europe's air defences, a gap caused by the non-existence or ill-equipped nature of European air forces. As these air forces were re-built, they began to assume increasing responsibility for their own defence. Moreover, the basis upon which they did so was not that of an integrated system; largely because of French opposition to integration, the single commander, single ground environment and single concept of air battle which were needed on military grounds did not exist... Because of this emphasis on the territorial nature of air defence, this role was an increasingly uncomfortable one for the Canadian air division.⁶⁵

Second, there was the change in NATO strategy as represented by MC 70 that placed a reliance on nuclear-equipped military forces to deter the Warsaw Pact.⁶⁶ This strategy included the build-up of NATO tactical air forces equipped with "tactical" nuclear weapons to be used in the interdiction role against various Warsaw Pact targets in Eastern Europe. Third, there was the

⁶⁵ McLin, p. 115. See also Glen Berg, *Scrambling for Dollars: Resource Allocation and the Politics of Canadian Fighter Aircraft Procurement*, Unpublished MA Thesis, Kingston: Royal Military College of Canada, 1993, p. 37. Berg raises the financial aspects regarding balance of payments and the high operating costs of the Air Division. As well, the Europeans were commencing their re-armament. However, as Berg points out, the final decision on the re-equipment of the Air Division was based on political grounds, not economic or military factors.

⁶⁶ DHH 73/1223, File 1826, Minutes of a Special Meeting of the Air Members, 20 February 1956. Subsequently, in 1956, at a special Air Council meeting, The AOC of No. 1 Air Division, Air Vice Marshal H.B. Godwin argued that the *Sabres* should be given a nuclear weapons carrying capability. In response, the CAS agreed that the *CF-100* and the *CF-105* interceptors would both have the capability to carry nuclear weapons.

political dimension – certainly no one even contemplated the withdrawal of the Air Division.⁶⁷

The commitment of the Air Division in 1951 to NATO in Europe was based on the perception of a real threat coupled with the weakness of the other NATO European states. The duration of that commitment had been left open at the time, though there was perhaps a very vague understanding that it would be withdrawn as the other NATO nations recovered economically thus allowing them to do more for their own defence. Fourth, there was the RCAF bureaucracy that understandably promoted the Big Air Force concept that had been realized in no small part by the deployment of No. 1 Air Division to Europe. If returned to Canada, the Air Division most likely would be disbanded. Fifth, the production of a new aircraft would provide the Canadian aircraft industry with contracts to offset the impending end of *Sabre* and *CF-100* production.

In 1954, the Air Council noted that the North American *F-100 Super Sabre*, the first US supersonic fighter then entering service with the USAF, might be a suitable replacement for the existing Air Division fighter aircraft, though nothing came of this proposal.⁶⁸ Despite the difficulties associated with continuing the air defence role, for some time the *CF-105 Arrow* had also been considered as a fighter replacement for the Air Division.

The strike reconnaissance role had been proposed to the St. Laurent government in 1956. The government, in McLin's words, "received the proposal unenthusiastically and, like other defence matters, postponed it until after the election."⁶⁹ It was not simply a matter of whether or not the Air Division should adopt the strike role, as SACEUR had recommended that this role be

⁶⁷ Roy Rempel, *Counterweights: The Failure of Canada's German and European Policy, 1955-1995*, Montreal and Kingston: McGill-Queen's University Press, 1996, p. 27. The future of the Air Division remained uncertain despite Campney's statement, in February 1957 that, "No replacement was planned for the F-86 aircraft. Once it became obsolete there would be little point in continuing to station the Air Division in France and Germany."

⁶⁸ DHH 73/1223, File 1825, Minutes of the 204th Meeting of Air Members, 4 October 1954. This discussion revolved around replacement of the *Sabre* in the air superiority/air defence role. The *F-104* was also suggested, though the aircraft was still in development, the prototype's first flight had been 4 March 1954.

⁶⁹ McLin, p. 116.

adopted in addition to the existing air defence role. This proposal was not acceptable on the grounds “that the assumption of two roles would be inconsistent with the agreed concept of balanced collective forces...[and]...a change to a strike role would involve substantial changes in the organization, and re-equipment of the Air Division.”⁷⁰ The Liberal government had no objection, in principle, to adopting the strike role, based on the assumption of dropping the air defence role, but additional defence expenditures were not acceptable.⁷¹ By 1957, re-equipment of the Air Division was recognized as a priority issue, but similar, as with Air Defence Command re-equipment, the Liberal government made no decision prior to its defeat in the June 1957 election, leaving the matter to the new Progressive Conservative government.

At the NATO Heads of State meeting held 16-18 December 1957, attended by Prime Minister Diefenbaker, the government agreed to the principle of arming NATO forces in Europe with tactical nuclear warheads.⁷² At this meeting, Defence Minister Pearkes stated,

One of our major decisions to be taken is the re-equipment and future role of the Canadian Air Division in Europe. This is not an easy decision to take, as long as there are unsettled issues concerning the equipment of our air force in the air defence of North America. These unresolved issues relating both to the defence of Canada/United States region, and to our commitments in Europe, naturally have a very important bearing on finance.⁷³

The Air Staff studied the requirements for the strike-reconnaissance role between January 1958 and July 1959 and made a number of submissions to the Chiefs of Staff Committee. The adoption of the strike-reconnaissance role was never in doubt, but as these studies progressed, it

⁷⁰ DHH 73/1223 Series 1, Box 21, File 363, “Future of Canadian Air Division,” Letter from Under-Secretary of State for External Affairs to Chairman, Chiefs of Staff, 19 November 1958.

⁷¹ Ibid.

⁷² The larger background to the difficulties surrounding NATO strategy are contained in the report by the Canadian NATO Ambassador Dana Wilgress, DHH 73/1223, Series 1, Box 21, File 363, “The Present Position of NATO,” 15 October 1957.

⁷³ DHH 73/1223, Series 1, Box 149, File 464, Memorandum “Re-Equipment of the Air Division – SHAPE Planning Guidance 1957,” 5 February 1959.

became obvious that the government wanted to undertake the commitment at the most economical cost. The days of “nothing but the best” for the Big Air Force were now over.⁷⁴ In the RCAF studies, twenty-one various aircraft were apparently considered for the strike role.⁷⁵ The Allied Command Europe Minimum Force Studies 58/63 indicated a Canadian air contribution of one strike and three attack squadrons, and eight all-weather fighter squadrons by 1961.⁷⁶ The RCAF, viewing the air defence role as no longer suitable, preferred to focus on the strike role:

- (a) It is a direct contribution to the deterrent, the basis of our strategy.
- (b) The Air Division will remain as a unified command which might not be so if we retain aircraft of a basically air defence design.
- (c) It will avoid the complications involving in developing an air defence system on an international basis. It will be some time before the inherent organizational and control difficulties in setting up such a system are overcome.⁷⁷

The initial RCAF study to re-equip the Air Division, submitted in January 1958, proposed eight squadrons with a total of 200 *F-105B Thunderchief* aircraft to be acquired at a cost of \$750 million, that number also including additional aircraft for the Operational Training Unit, pipeline and attrition spares. This proposal represented an expensive option utilizing a heavy supersonic strike fighter. The submission to the Chiefs of Staff Committee noted, “acceptance of the strike role would involve Governmental policy on the use of atomic weapons....”⁷⁸ A subsequent submission classified the various aircraft types into strike/attack aircraft, lightweight strike fighter, conventional and lightweight reconnaissance aircraft

⁷⁴ See “F-104G Contract Decision Defines Government Policy” (Editorial), *Canadian Aviation*, Vol. 32, No. 9, September 1959. In its rejection of such aircraft as the *F-105* and the *F-4 Phantom* in favour of its ultimate selection, the *F-104G*, the government sought the cheapest option to re-equip the Air Division.

⁷⁵ However, many of these aircraft were merely “strawmen” for the programme, being unsuitable, extremely costly or unavailable. The serious contenders were the Grumman *Super Tiger*, Lockheed *F-104G Starfighter*, *F-105 Thunderchief*, McDonnell Douglas *F-4 Phantom*, and the Northrop *N156F*.

⁷⁶ DHH 73/1223, Series 1, Box 149, File 464, S096-11-66/1 (CAS), Future Role and Re-Equipment of No. 1 Air Division, 28 January 1958.

⁷⁷ *Ibid.*

⁷⁸ *Ibid.*

categories.⁷⁹ Further analysis on the future role and re-equipping of the Air Division examined a number of options including a comparison of the Northrop *NI56F* (eventually to become the *F-5*) and the Republic *F105*, land-based *Polaris* IRBMs, strike and reconnaissance versions of the Avro *Arrow*, modification of the *Sabre* for the strike role, and *Sabre* and *CF-100* improvements to allow for the continuation of the air defence role.⁸⁰ On 8 April 1958, General Foulkes and the Chiefs of Staff briefed Minister Pearkes on the subject.⁸¹ In discussion, the CAS noted that given the obsolescence of the existing aircraft, a continuation of the air defence role was not a consideration. Interestingly, General Foulkes noted “there was little use in spending the Canadian defence dollar in putting more high performance, high altitude aircraft on permanent runways in Europe. These could be destroyed very easily by missile attack with very little notice.”⁸² Rather than a large sophisticated aircraft such as the *F-105B*, the Northrop *NI56F* seemed a more sensible option. It was noted, however, that the *NI56F* still required the use of runways and might only be useful as an interim solution. After this briefing, it was decided to defer any decisions on Air Division re-equipment until the Fall 1958.⁸³ By November 1958, the RCAF had refined its requirement based on the need for a low-level flying aircraft to penetrate enemy territory rather than a high altitude aircraft. The

⁷⁹ DHH 73/1223, Series 1, Box 149, File 464, Memorandum, TS1015-6-4 TD 141, Operational Characteristics and Aircraft to Meet SACEUR Requirements 60/62, 13 February 1958. Though the lightweight strike fighter and reconnaissance categories are mentioned, it was never the RCAF intention that the service would engage in those roles. The NATO Lightweight Fighter Competition had begun in 1954, with the winning aircraft being announced in 1958 as the Italian Fiat *G.91* much to the chagrin of the French who believed that any of their three entries was superior to the *G.91*. Ultimately, the *G.91* served only with West Germany and Italy. See Robert Jackson, *Cold War Combat Prototypes*, Chapter 17, “Lightweight Fighters,” and Pierre M. Gallois, “Lighter, Slower, Cheaper: NATO’s Light Strike Fighter Programme,” *Interavia*, Vol. XII, No. 9, September 1957.

⁸⁰ DHH 73/1223, Series 1, Box 149, File 464, S096-100-66/1, Supporting Data for Chiefs of Staff Committee – Future Role and Re-equipment of No. 1 Air Division RCAF, 28 February 1958. This information was briefed to the MND on 8 April 1958.

⁸¹ DHH 73/1223, Series 1, Box 149, File 464, S096-100-66/1 (VCAS), Aide-Memoire – Future Role and Re-equipping of No. 1 Air Division, 10 April 1958.

⁸² *Ibid.*

⁸³ DHH 73/1223, Series 1, Box 149, File 464, “Re-equipping of the Air Division,” Synopsis of Briefing to MND on 8 April 1958, Author unknown, but most likely Colonel Raymont, Staff Officer to Chairman, Chiefs of Staff Committee, 9 April 1958.

RCAF had narrowed its focus on an examination of the *N156F*, the Grumman *F11F-1F Super Tiger* and the Blackburn *NA 39 Buccaneer*.⁸⁴ Concurrently, the Department of External Affairs was engaged in a campaign “to avoid creating any impression, either in Canada or abroad, that consideration is being given to the withdrawal of the Air Division from Europe.”⁸⁵ Shortly thereafter on 3 December 1958, when the RCAF had re-examined the commitment for the Air Division to conduct both the strike/attack and all-weather interceptor roles, it was determined that this was a feasible commitment utilizing one type of aircraft for both roles.⁸⁶ The preferred aircraft was now the Grumman *Super Tiger* to equip twelve squadrons each with a Unit Establishment of eighteen aircraft.⁸⁷ The total requirement was identified as 340 aircraft to equip the Air Division squadrons, the Operational Training Unit, pipeline and attrition aircraft. The *Super Tiger* would be built under license with a programme cost of \$645 million.⁸⁸ By 23 January 1959, the Minister had recommended to Cabinet that 214 *Super Tiger* fighters be procured, but only to replace the eight *Sabre* squadrons at a cost of \$367 million. The *CF-100* squadrons were not to be re-equipped.⁸⁹ In February 1959, the cost for the proposed *Super Tiger*

⁸⁴ DHH 73/1223, Series 1, Box 149, File 464, S981-101-87 (CAS), “Replacement Aircraft – No. 1 Air Division, 19 November 1958.

⁸⁵ DHH 73/1223, Series 1, Box 149, File 464, Draft Memorandum to Chairman, Chiefs of Staff Committee from Under-Secretary of State for External Affairs, “Future of Canadian Air Division,” 19 November 1958.

⁸⁶ DHH 73/1223, Series 1, Box 149, File 464, S895-100-56/1 (CAS), “Future of the Canadian Air Division,” 3 December 1958.

⁸⁷ See Tony Buttler, *American Secret Projects: Fighters and Interceptors 1945-1978*, Hinckley: Midland Publishing, 2008, pp. 113-114. The proposed Grumman G-98J-7 *Super Tiger* was a two-seat multi-role fighter powered by a J79 engine capable of Mach 2 armed with *Sparrow* and *Sidewinder* missiles for the interceptor role. See also Corky Meyer, “Tale of the Super Tiger: The F11F-1F Story,” *Wings*, Vol. 36, No. 2, February 2006.

⁸⁸ DHH 73/1223, Series 1, Box 149, File 464, S096-100-66/1 (CAS) “Future Role and Re-Equipment of No.1 Air Division RCAF,” 8 December 1958. See also DHH 73/1223, Series 1, Box 149, File 464, Memorandum for Chiefs of Staff Committee, “Future Role and Re-Equipment No. 1 Air Division RCAF,” 21 January 1959.

⁸⁹ DHH 73/1223, Series 1, Box 149, File 364, Memorandum to the Cabinet – Re-Equipment of No. 1 Air Division RCAF, 29 January 1959.

programme was revised at \$452 million, this significant increase suggesting that the *Super Tiger* was not the “cheap” solution to re-equipping the Air Division.⁹⁰

During March 1959 while a decision on re-equipping the Air Division appeared imminent, two occurrences added to the intrigue and friction associated with the impending government decision. First, there was the letter from Major General George Kitching, Commander of the Canadian Joint Staff at the High Commission in London to General Foulkes relating his recent unofficial discussions with various NATO air force officers specialized in air defence. From these discussions, Kitching recommended, “that in considering the re-equipment of the Air Division we do not in any way [underlining in original letter] get mixed up in the Air Defence side of NATO.”⁹¹ This recommendation was based on the views of these NATO officers that the NATO air defence system would not function and would result in a “bottomless pit into which vast sums of NATO funds will be wasted.”⁹² The second event was the unsolicited proposal submitted by Air Vice Marshal (Retired) John Plant from Avro Canada proposing the licensed production of the Republic *F-105 Thunderchief* powered with the *Iroquois* engine (the engine intended for the *Arrow Mk. 2*) to re-equip the Air Division now that the Avro *CF-105 Arrow* programme had been cancelled.⁹³ In response to the Minister, the CAS provided a comparison between the *F105* and the *Super Tiger*, noting, “the RCAF prefers the Grumman *Super Tiger* as it offers the best compromise between operational capability on the one hand and budgetary limitations on the other.”⁹⁴ The Memorandum to the Cabinet, dated 5 June 1959,

⁹⁰ DHH 73/1223, Series 1, Box 149, File 364, Memorandum to the Cabinet Defence Committee – Re-Equipment of No. 1 Air Division RCAF, 24 February 1959.

⁹¹ DHH 73/1223, Series 1, Box 149, File 364, Letter from Major-General George Kitching, Commander Canadian Joint Staff London to Chairman, Chiefs of Staff, 17 March 1959.

⁹² Ibid.

⁹³ DHH 73/1223, Series 1, Box 149, File 364, S1038-110-1 (CAS) Memorandum – “Comparison of Grumman F11F-1F and Republic F105,” 9 April 1959.

⁹⁴ Ibid.

recommended that either the Grumman *Super Tiger* (the first choice) or the Lockheed *F104G* (second choice) be selected to re-equip the *Sabre* squadrons in the Air Division:

Both are high performance aircraft but the F11F-1F has superior flying characteristics for low-level strike operations. The Super Tiger is more flexible also in terms of the weapons that it can carry without serious degradation of performance. In addition, the Super Tiger is much better suited for short field operations and can be launched by catapult and recovered with arrestor gear. It can, therefore, be operated from shorter runways and a greater variety of airfields.⁹⁵

It appears that there was some vacillation on the part of the Cabinet in making a final decision on this expensive re-equipment programme, as the CAS with the concurrence of the Chairman, Chiefs of Staff, submitted a memorandum to the Minister two weeks later on 18 June regarding the “military need for a decision now on the re-equipping of the air division.”⁹⁶ At the Cabinet meeting the next day, approval was granted for the procurement of 214 aircraft to re-equip the Air Division, based on either the Grumman *F11F-1F Super Tiger* or the Lockheed *F104G*.⁹⁷

The result of a subsequent discussion between the Chairman, Chiefs of Staff, the CAS, and the DND Deputy Minister, Frank Miller, with the Deputy Minister of the Department of Defence Production, David Golden, recommended that the RCAF adopt the *F104G* for the strike-reconnaissance role in the Air Division.⁹⁸ This recommendation was based on the notion of greater prospects for reduced costs through shared development and increased production with

⁹⁵ DHH 73/1223, Series 1, Box 149, File 364, Memorandum to the Cabinet, “Re-Equipment of F86 Squadrons in No. 1 Air Division, RCAF,” 5 June 1959. In a 26 November 1958 letter to the CAS, Air Marshal C.R. Dunlap (a future CAS), then serving at SHAPE as Deputy Chief of Staff for Operations, noted that the *F104* had earlier been considered and rejected for the strike role. Dunlap noted that he had been led to believe the new version, the *F104G*, with long-range tanks provided an effective range and that its limited all-weather capability would make it a valuable air defence aircraft – all at a reasonable cost. DHH 73/1223, Series 1, Box 149, File 364, Letter from Air Marshal C.R. Dunlap to Air Marshal Hugh Campbell, Chief of the Air Staff, 26 November 1958.

⁹⁶ DHH 73/1223, Series 1, Box 149, File 364, S096-100-66/1 (CAS), Memorandum – Military Need for a Decision Now on the Re-equipping of the Air Division,” 18 June 1959.

⁹⁷ DHH 73/1223, Series 1, Box 149, File 364, Record of Cabinet Decision – Meeting of June 19th, 1959 – Policy Concerning Re-equipment of the Air Division, 23 June 1959.

⁹⁸ DHH 73/1223, Series 1, Box 149, File 364, Chairman, Chiefs of Staff to the Minister, Re-equipping the 1st Air Division – Designation of Replacement Aircraft, 29 June 1959, and Chairman, Chiefs of Staff to the Minister, Re-equipping of the Air Division, 30 June 1959.

the *F104G* rather than the *Super Tiger*.⁹⁹ At the 2 July 1959 Cabinet meeting, the government approved the procurement of the Lockheed *F104G* to replace the *Sabre* fighters in the Air Division.¹⁰⁰ The cost to procure the *CF-104* was \$464 million consisting of 200 single-seat *CF-104* strike fighters and thirty-eight *CF-104D* two-seat trainers.¹⁰¹ The Canadian decision was greatly influenced by the West German approval to procure the *F104G* in December 1958. Once the West Germans had selected the *F-104G*, it seemed logical at the time that the smaller NATO countries would follow suit.¹⁰² Though the *F104* had originally been designed as a lightweight interceptor, the *F-104G* was specifically developed as a multi-role fighter designed for nuclear strike, conventional attack, reconnaissance, and air defence roles.¹⁰³ In the case of the Canadian version, however, the *CF-104* was a single-role aircraft, limited to the nuclear strike role in Europe.¹⁰⁴ The procurement of a specialized aircraft that had no operational role in Canada or elsewhere proved to be an expensive decision. Its selection complicated and increased training and logistics costs, as there was still a requirement to maintain another type of fighter aircraft in Canada for the air defence role. The procurement of the *CF-104* did at least keep the production lines at Canadair open, and additional *F-104s* were produced for other NATO air forces and paid

⁹⁹ DHH 73/1223, Series 1, Box 149, File 364, Chairman, Chiefs of Staff to the Minister, Re-equipping the 1st Air Division – Designation of Replacement Aircraft, 29 June 1959.

¹⁰⁰ DHH 73/1223, Series 1, Box 149, File 364, Record of Cabinet Decision – Meeting of July 2nd, 1959, 10 July 1959.

¹⁰¹ Clearwater, p. 109. The *CF-104D* retained the capability to undertake tactical nuclear strike weapons.

¹⁰² Later revelations on Lockheed's zealous approach on paying "commissions" were raised by Anthony Sampson, *The Arms Bazaar - The Companies, the Dealers, the Bribes: from Vickers to Lockheed*, London: Hodder and Stoughton, 1977, pp. 123-132. This is not to suggest whatsoever that there was any impropriety in the Canadian decision to acquire the *F104G*.

¹⁰³ Bill Gunston, *Early Supersonic Fighters of the West*. See also Martin W. Bowman, *Lockheed F-104 Starfighter*, Ramsbury: The Crowood Press Limited, 2000 and See also Lou Drendel, *F-104 Starfighter in Action*, Carrollton, TX: Squadron/Signal Publications Inc, 1976. The *F-104G* was adopted by nine of the thirteen NATO air forces and license-built in five of these nations as a multi-role aircraft functioning as standardized NATO weapons system.

¹⁰⁴ See David L. Bashow, *Starfighter: A Loving Perspective of the CF-104 Era in Canadian Fighter Aviation 1961-1986*, Toronto: Fortress Publications Inc, 1990. See also Anthony L. Stachiw and Andrew Tattersall, *Canadair CF-104 Starfighter*, St Catherines': Vanwell Publishing Limited, 2007 and Bob McIntyre, *Canadian Profile CF-104 Starfighter*, Ottawa: Sabre Model Supplies Ltd Publishing, 1984. Significant differences between the *CF-104* version and the European *F104G* were the deletion of the M61 Vulcan cannon and its ammunition, the space being occupied by additional fuel cells, and the radar being optimized for the air to ground mode, modifications that emphasized the *CF-104* low-level nuclear tactical strike role.

for by the US Mutual Aid Program.¹⁰⁵ In contrast, the Grumman *F11F-1F Super Tiger*, the original preference of the RCAF, had been lauded for its multi-role capability for both air defence and strike roles. In addition, the *Super Tiger* was portrayed as a suitable aircraft for employment on UN operations in other parts of the world.¹⁰⁶ The selection of a multi-role aircraft would have provided increased flexibility to the RCAF in the deployment of its fighter squadrons for use with NORAD at home, with NATO in Europe or supporting UN operations in other parts of the world.

The decision to re-role the Air Division from air defence to strike-reconnaissance, a role that by definition implied the use of nuclear weapons, was the principal issue regarding Air Division re-equipment. The RCAF had rejected alternative roles such as air transport or offensive bombing and there was no requirement for such a role from the Supreme Allied Commander Europe (SACEUR). The SACEUR, General Norstad did not consider the withdrawal of the air division as being an option, based on the direct military value of the air division and “the example it set for the smaller European nations as the kind of efficient military contribution that was within the capacity of small countries to make.”¹⁰⁷ When Pearkes announced the new strike-reconnaissance role for the RCAF on 2 July 1959, no mention was made of nuclear weapons.¹⁰⁸ The RCAF Public Relations branch also obfuscated the issue of *CF-104* armament by stating:

The CF-111 [the original nomenclature for the *CF-104*] will be capable of carrying a wide variety of weapons: any decision as to which of these weapons will be selected

¹⁰⁵ Berg, pp. 136-137. Apart from *CF-104* production, Canadair also produced *F-104Gs* for other NATO air forces and sub-components for European produced *F-104Gs*

¹⁰⁶ DHH 73/1223, Series 1, Box 21, File 363, CSC 1498.1, 21 January 1959, Future Role and Re-equipment of No. 1 Air Division, RCAF.

¹⁰⁷ McLin, p. 115.

¹⁰⁸ Ibid. p. 117.

is classified. . . . a recent Lockheed News release on this aircraft described it as being capable of carrying both conventional and nuclear weapons.”¹⁰⁹

It was not only the fact that the RCAF had acquired the *CF-104* for a purely nuclear strike role that remained obscure, but it was also the size of the potential nuclear weapons that could be used by the *CF-104*, with warhead yields ranging from twenty kilotons to one megaton, a fact that did not become public until 1998.¹¹⁰

The first Canadair-built *CF-104* rolled off the production line in May 1961, and No. 6 (Strike and Reconnaissance) Operational Training Unit was established at Cold Lake to train pilots on the *CF-104*.¹¹¹ The first *CF-104* squadron was formed on 17 December 1962 with the last of the eight *CF-104* squadrons being formed in March 1964, making a total of 160 *CF-104* aircraft in the division.¹¹² Due to indecision in the Diefenbaker government about accepting the nuclear weapons needed to make the *CF-104s* effective weapons of war, the aircraft were sitting unarmed on their airfields in West Germany and France as rather expensive and useless pieces of flying equipment.¹¹³ With the election of the Kennedy administration that placed a renewed emphasis on conventional weapons, the utility of the strike-reconnaissance role was being questioned in Canadian defence policy discussions. In 1962, even as the Air Division was re-

¹⁰⁹ See O.G. Nelson, “New Role, New Aircraft for RCAF in Europe,” *The Roundel*, Vol. 11, No. 8, October 1959. See also “CF-104: Fast and Furious – CF-104 Gives RCAF an Unfamiliar Strike Capability,” *Aircraft*, Vol. 23, No. 3, March 1961. The article also confuses the issue on the *CF-104*’s nuclear armament due to it being “classified,” but notes that the M61 cannon would not be installed, providing using the space for additional fuel to “provide maximum range for specific bombing missions.”

¹¹⁰ Clearwater, pp. 91-116. The yields for the warheads for the *B28EX* and *B28RE* bombs could vary from 70 and 350 kilotons to 1.1 and 1.45 megatons, though it is believed that the *CF-104s* carried only low-yield weapons. The warhead for the *B57* had a 20 kiloton yield, but the warhead for the *B43* was a one-megaton yield. In comparison, the weapons used on Japanese cities had a yield of approximately 20 kilotons, but subsequently this size of warhead was considered for tactical use. However, one megaton yields equated to large-scale “city busting.”

¹¹¹ Les Edwards, “Groundhugging at Mach 2,” *Canadian Aviation*, Vol. 35, No. 9, September 1962.

¹¹² Each squadron had a Unit Establishment of eighteen *CF-104* and two *CF-104D* aircraft. The Air Division now consisted of four wings each of two squadrons. The *CF-100* equipped-squadrons had been disbanded 31 December 1962.

¹¹³ DHH 73/1223, Series 1, Box 21, File 365, Memorandum – Re-Equipment of 1 Air Division with CF-104 Aircraft, 21 July 1960. The CAS had prepared a memorandum for the MND for furtherance to the Prime Minister outlining the reasons why the RCAF recommended replacing the *Sabre* fighter squadrons with the *CF-104* strike-reconnaissance fighters in the Air Division and the ramifications if the Air Division was not re-equipped. However, the *CF-104* was not capable of conducting the conventional attack role at this time.

equipping with the *CF-104*, defence commentator John Gellner noted that the “F-104 was strategically obsolete.”¹¹⁴ The Gellner article in *Canadian Aviation* evoked discussion at NDHQ with the Air Staff rebuking the contents of the article.¹¹⁵ The Liberal party had previously flip-flopped on the issue of the acquisition of nuclear weapons for the Canadian Forces. In 1959, Pearson suggested that tactical nuclear weapons should be treated as conventional weapons.¹¹⁶ Later, in 1960 and 1961, the Liberal party opposed nuclear weapons and the strike-reconnaissance role.¹¹⁷ For the NATO role, the Liberal Party was in favour of cancelling the *CF-104* strike programme and obtaining conventionally armed ground support aircraft that could directly support the Canadian brigade group in West Germany.¹¹⁸

Air Transport Command Re-equipment

While the “sharp end” of the RCAF focused on the creation of a “nuclear air force,” Air Transport Command underwent a modernization programme that improved its effectiveness and versatility to support peacekeeping operations.¹¹⁹ In 1960, the RCAF received its first four Lockheed *C-130B Hercules* turboprop transports at a cost of \$14 million with the ability to handle out-size cargo.¹²⁰ The RCAF also received the first four of eight De Havilland Canada *CC-108 Caribou* tactical transports that year with the intention of deploying them with the United Nations in the Congo (UNOC).¹²¹ The *Caribous* were not used in the Congo, but they did

¹¹⁴ John Gellner, “F-104 Strategically Obsolete”, *Canadian Aviation*, Volume 35, Number 9, September 1962, p. 81.

¹¹⁵ DHH 73/1223 Series 1, File 365, Re-equipment/Re-organization 1 Air Division – 10380CL – TD 22263 (CAS) Letter from Air Marshal C.R. Dunlap to MND, “Article by John Gellner in the September Issue of Canadian Aviation,” 27 September 1962.

¹¹⁶ McLin, p. 152.

¹¹⁷ Ibid. p. 153.

¹¹⁸ “Liberal Defence Program,” *Aircraft*, Vol. 22, No. 9, September 1960.

¹¹⁹ See R.J. Lane, “The Evolution and Current Status of Air Transport Command,” *The Roundel*, Vol. 14, No. 2, March 1962. See also Brent Raycroft, “ATC Capability as CL-44 and Hercules Added to Inventory,” *Aircraft*, Vol. 23, No. 1, January 1961.

¹²⁰ RCAF Buys Hercules,” *Aircraft*, Vol. 22, No. 4, April 1960. See also A.E.F. Patterson, “Workhorse of Air Transport Command,” *The Roundel*, Vol. 16, No. 4, May 1964.

¹²¹ For RCAF operations in the Congo with UNOC see R.M.L. Bowdery, “A Year in the Congo,” *The Roundel*, Vol. 13, No. 2, September 1961, T.G. Coughlin, “Candid Congo,” *The Roundel*, Vol. 16, No. 1, January-February 1964,

replace the *Dakota* transports serving with No. 115 Air Transport Unit in Egypt with UNEF.¹²²

In 1958, the RCAF did not originally want to procure the *CC-108*, and it was the Canadian Army that was willing to provide the funding for eleven aircraft to conduct trials using the *Caribou*, along with helicopters, for re-supply of units operating in forward areas, particularly on the nuclear battlefield. Eventually, the Air Council agreed to cooperate with the Canadian Army on *Caribou* trials.¹²³ To replace its *Dakota* wartime medium transports, No. 412 Squadron at Uplands was re-equipped in 1960 with the Canadair *CC-109 Cosmopolitan*, a turbo-prop engine version of the *Convair 440* twin-engine airliner, at a cost of \$23 million.

In October 1961, No. 437 (Transport) Squadron was formed in Trenton equipped with the four-turboprop engine *CC-106 Yukon* long range transport that represented a quantum leap in capability compared to the *North Star* that it was replacing, but it still had its limitations, particularly as it was dependent on airfield handling equipment to load and unload cargo using its side doors.¹²⁴ This was in contrast to the *Hercules* with its rear-loading ramp that facilitated ease in cargo handling. Another criticism of the *Yukon* was the fact it was a turboprop airliner entering RCAF service at a time when jet transports were about to make their entry into the skies. One RCAF air transport officer who later served as Commanding Officer of No. 437 Squadron, subsequently wrote:

The air staff view was that since we were already operating the Comet jet transport and Boeing and Douglas were about to launch the 707 and DC-8 respectively, the obvious course for a new logistics transport should be a fast, high capacity, jet-

William K. Carr, "The RCAF in the Congo, 1960," *CAHS Journal*, Vol. 43, No. 1, Spring 2005, and Kevin A. Spooner, *Canada, the Congo Crisis, and UN Peacekeeping, 1960-1964*, Vancouver: UBC Press, 2009, pp. 85-87.

¹²² Raycroft. See also T.G. Coughlin, "Our Men in the Desert," *The Roundel*, Vol. 14, No. 8, October 1962.

¹²³ DHH 73/1223 File 1828, Minutes of Air Council Meeting 12 March 1958 and Minutes of Air Council Meeting 19 March 1958. See also "No DHC-4s for Canadian Army?" *Aircraft*, Vol. 22, No. 2, February 1960. Though the *Caribou* was not procured for Army support, and only nine aircraft were procured for the RCAF, ultimately, this led to the procurement of the *CC-115 Buffalo* tactical transport that was a progressive turbo-prop development of the *Caribou*.

¹²⁴ "Canadair's Transport," *Royal Air Force Flying Review*, Vol. XVI, No. 7, April 1961.

powered aircraft....A political decision had been made that another version of the Bristol Britannia...would be built at Canadair, thus solving the political and aerospace industries problem while relegating the military to making do with an aircraft that was destined to be obsolete before the first aircraft rolled off the production line.¹²⁵

It was not only a matter of falling behind the procurement of modern technology, but the type of aircraft being acquired. For the same expenditure as the *Cosmopolitan* procurement, Air Transport Command could have added another six *C-130 Hercules* transports that would have provided more flexibility than the *Cosmopolitan* airliners. Given the requirement to operate transports on rough field operations, pure airliner types such as the *Cosmopolitan* and *Yukon* were the wrong type of aircraft for Air Transport Command.

The Carpenter Report versus the Nuclear Air Force

In February 1961, the Air Council authorized the establishment of the Special Studies Group on Long Range Objectives for the RCAF with the aim of developing long-range strategic guidance for the RCAF beyond ten years in the future.¹²⁶ This RCAF initiative was nothing novel as both the RCN and the Canadian Army had conducted similar studies, and with the introduction of new roles and equipment, it was appropriate to examine the future of air power in the next decade.¹²⁷ In June 1961, Air Commodore Fred Carpenter was appointed Chief of Special Studies, reporting directly to the CAS, Air Marshal Campbell.¹²⁸

There were a number of inter-related developments coalescing to create the “perfect storm” for the air force in planning its future. First, fiscal constraint and reductions in defence

¹²⁵ Lieutenant-General David R. Adamson (Retired), “The Yukon Saga,” *Air Force Magazine*, Vol. 33, No. 3, Fall 2009, p. 30. Adamson directed the same criticism regarding political and industrial decision-making towards the procurement of the Canadair *Cosmopolitan* airliner that replaced the *Dakota* transport in Air Transport Command.

¹²⁶ See Bertram Frandsen, “Air Vice Marshal Fred Carpenter and the RCAF Vision,” Unpublished paper presented at the 14th Annual Air Force Historical Workshop, 24-25 September 2008, Kanata, Ontario.

¹²⁷ See *The Roundel*, Vol. 13, No. 6, July-August 1961. The entire issue of *The Roundel* was devoted to the ongoing changes in the RCAF over the past year 1960-61.

¹²⁸ Carpenter had completed five years as the AOC Air Transport Command that including extensive involvement in both the Suez and Congo operations.

spending had been the principal drivers in the defence programme since the Progressive Conservative government ascension to power in 1957. The Golden Age of the RCAF had ended, and the service was now receiving less funding in absolute terms and also in its share of the defence budget. As well, much of the budget was allocated to personnel and operations costs, with a declining amount available for capital expenditures – this at a time of major re-equipment for the RCAF. This had a tremendous impact on the “strategy without dollars” approach of the Progressive Conservative government. There was the strategic dissonance regarding defence policy associated with the Diefenbaker government that was to worsen and eventually contribute to its defeat and the return of the Liberals in 1963. This represented the “defence debacle” arising from confusion and obfuscation over the Avro *Arrow* cancellation, and acquisition of nuclear delivery systems in the form of the *CF-104* for the Air Division and the *Voodoo* and *BOMARC* for Air Defence Command. The bulk of RCAF capital expenditures were allocated for procurement of these nuclear delivery systems – but without their nuclear weapons! Budget pressures were exacerbated by cost overruns on the Avro *Arrow* programme that resulted in reduced procurement for the *Argus* maritime patrol aircraft and *Yukon* transports. At the 1959 AOC Conference, Air Vice Marshal Cornblat, the RCAF Comptroller, commented, “we have an estimated \$315 million available to undertake an estimated \$840 million of new programme.”¹²⁹

The Report of the Special Studies Group on Long Range Objectives for the RCAF was submitted to the CAS on 29 June 1962 where it was promptly filed away in a classified filing cabinet.¹³⁰ Referred to as the “Carpenter Report,” this study proposed an alternative future for the

¹²⁹ DHH 73/1223, Series 3, Subseries 14, Box 102, File 2002, Minutes of a Conference of Air Officers Commanding and Air Officers, 17-19 March 1959, Appendix F – Distribution of Resources 1959-64 AOC Conference – Address by Air Vice Marshal I.C. Cornblat, Comptroller, 18 March 1959, p. 2.

¹³⁰ DHH 73/1223, Series 3, Subseries 13, Box 90, File 1819, Royal Canadian Air Force Report of the Special Studies Group on Long Range Objectives for the RCAF, June 1962. See also Colonel (Ret'd) Fred Carpenter, “The RCAF Report That Wasn't,” *Canadian Military Journal*, Vol. 3, No. 2, Summer 2002, and Paul Hellyer, *Damn the Torpedoes: My Fight to Unify Canada's Armed Forces*, Toronto: McClelland and Stewart Inc, 1990, pp. 109-110.

RCAF in contrast to the actual approach being pursued in the early 1960s. The Carpenter Report presented the RCAF with a Mitchell “anything that flies” approach to air power that contrasted with the prevailing RCAF focus on creating the “Douhet with nukes” air force. The report identified the Soviet Union as the main military threat, but the danger of total war was deemed to be slight, and if it did occur, it would be the result of the escalation of a minor conflict.¹³¹ The new threat emanating from numerous so-called “brushfire” conflicts around the world required highly flexible and mobile conventional armed military forces, including air forces, capable of a full spectrum of operations ranging from providing technical advice, performing police actions, monitoring truce agreements, organizing and engaging in guerilla activity to fighting in limited wars.¹³² In order to meet the requirements for this type of conflict, the report proposed a revised RCAF force structure that featured multi-purpose combat aircraft and a tremendous increase in tactical and strategic transport capabilities.¹³³ The proposed future RCAF force structure is summarized at **Table 6-2** below.

Table 6-2: Possible Composition of the RCAF – 1970s		
Ref: Report of the Special Studies Group on Long Range Objectives for the RCAF, June 1962		
Tactical Air Command	Strike, close support, recce and air defence	12 sqns – STOL multi-purpose combat aircraft
	Tactical transport	8 sqns – tactical transport. 4 sqns – heavy helicopter
Air Defence Command	Air Defence	3 sqns - STOL multi-purpose combat aircraft (additional sqns to come from TAC)
	Air Defence	2 sqns - BOMARC

¹³¹ Report of the Special Studies Group on Long Range Objectives for the RCAF, p. 12.

¹³² Ibid. p. 15. See also Robert Saundby, “Air Power in Limited Wars,” *The Royal United Services Institute Journal*, Vol. CIII, No. 611, August 1958.

¹³³ Report of the Special Studies Group on Long Range Objectives for the RCAF, pp. 25-28.

Air Division (Resources assigned from TAC)	Strike, close support, recce and air defence	3 sqns - STOL multi-purpose combat aircraft
	Tactical Transport	2 sqns – tactical transport 1 sqn – heavy helicopter
Air Transport Command	Strategic transport	5 sqns – heavy transport
	Special transport	1 sqn – special transport
	Flight refuelling	1 sqn – jet refuelling
	Long range recce	1 sqn – long recce
Maritime Air Command	Maritime patrol	3 sqns – maritime patrol
Training Command	Training	RCAF and foreign aid
Air Materiel Command	Support	Task Force support

In the case of the multi-purpose combat aircraft, it was to be available in two versions – air defence and tactical support, capable of using both conventional and nuclear armament. It would be two-crew, two-engine, capable of Mach 2.35, and the tactical version would ideally have a Vertical Take-Off and Landing (VTOL) capability. The estimated cost of the multi-purpose combat aircraft was \$2.5 million.¹³⁴ The report also included the required characteristics for the strategic and tactical transports.¹³⁵ This report was not intended for implementation in isolation, as it noted that discussions were required with DND and the other services in order to proceed to the next level. The Tactical Air Command was seen as the centerpiece of the new air force reflecting changes that had already occurred in the USAF and RAF.¹³⁶ Some of the ideas

¹³⁴ Ibid. p. 32.

¹³⁵ Ibid. pp. 33-35. See also R.G. Husch, “Future Long Range Air Transport in the RCAF,” *Air Force College Journal*, 1964. In this article, Squadron Leader Husch discussed a replacement for the *Yukon* and *Hercules* transports, noting that the *C-141* was unable to utilize semi-prepared runways. Husch noted the growing importance of airlift in the military strategy for brushfire wars.

¹³⁶ In the case of the USAF, the Composite Air Strike Force was equipped with a variety of combat aircraft and transports to rapidly deploy overseas. See Henry P. Viccellio, “Composite Air Strike Force,” *Air University Review*, Vol. IX, No. 1, Winter 1956-57, and Henry Viccellio, “The Composite Air Strike Force 1958,” *Air University*

contained in the report had been earlier raised by Carpenter during discussions at the annual AOC Conference which he attended in his capacity as AOC Air Transport Command. For example, at the 1960 AOC Conference, Carpenter commented, “I would suggest two fairly extreme courses of action for the armed forces. First – in the RCAF we should use what influence we have to achieve a single service. Second, we should admit that we have no large offensive capability and we should, in fact, go along with what is likely to be the most probable policy of our government – that we should not have atomic weapons.”¹³⁷ He recommended that the RCAF should obtain conventionally armed strike-reconnaissance aircraft.¹³⁸ Carpenter also suggested decreases in the size of Air Defence Command and Maritime Air Command.¹³⁹ At the 1961 AOC Conference, Carpenter proposed an increase in the number of transport squadrons and questioned the utility of the strike-reconnaissance role for the *CF-104*.¹⁴⁰ Looking ahead ten years to the future design of the forces, he suggested that the ability to fight a limited war needed consideration.¹⁴¹ Referring to his experiences in planning transport operations for Suez and the Congo, Carpenter suggested that the RCAF was reluctant to provide additional support to the UN.¹⁴²

In bureaucratic terms, the submission of the Carpenter Report on 29 June 1962 to the CAS, Air Marshal Campbell, could not have come at a worst time. DND, including the RCAF, was subject to further reductions in expenditures for FY 1962/63. Overall government spending

Review, Vol. XI, No. 2, Summer 1959. For the RAF, No. 38 Group was re-established within Transport Command on 1 January 1960 equipped with *Hunter* jet fighters, tactical transports and helicopters to provide close air support and tactical mobility to deployed troops in the Strategic Reserve. See N. Cameron, “The 38 Group Concept,” *The Royal Air Forces Quarterly*, Vol. 2, No. 2, Summer 1962, and A.R. Gordon-Cumming, “Fighters in Transport Command,” *The Royal Air Forces Quarterly*, Vol. 4, No. 4, Winter 1964.

¹³⁷ DHH 73/1223, Series 3, Subseries 14, Box 103, File 2007, Minutes of the Proceedings of the Air Officers Commanding and Air Officers Conference, 15-17 March 1960.

¹³⁸ *Ibid.*

¹³⁹ *Ibid.*

¹⁴⁰ DHH 73/1223, Series 3, Subseries 14, Box 103, File 2008, Minutes of the Proceedings of the Air Officers Commanding and Air Officers Conference, 21-24 March 1961.

¹⁴¹ *Ibid.*

¹⁴² *Ibid.*

was to be reduced by \$250 million, including \$67 million for DND. Of that amount, the RCAF share was \$29 million representing a 4.1 per cent reduction.¹⁴³ Campbell retired in September replaced as CAS by Air Marshal C.R. “Larry” Dunlap. Dunlap had joined the RCAF in 1928, serving as the Director of Armament at AFHQ during the early part of the war 1939-42 and then overseas commanding a bomber wing and station until May 1945. After the war, Dunlap returned to AFHQ as the Deputy Air Member for Air Staff and then Air Member Air Plans until 1948. He was then appointed the Air Officer Commanding North-West Air Command, 1949-1951, Commandant National Defence College 1951-1954, Vice Chief of the Air Staff 1954-1958 and afterwards DCOS Operations at SHAPE.¹⁴⁴ The new CAS had to contend with the ongoing crises that by this time had engulfed the Canadian government and at the same time run an air force. The October 1962 Cuban Missile Crisis and the crisis in Diefenbaker’s government overshadowed any interest in alternative RCAF force structures. However, many of Carpenter’s ideas and the proposals in the “Carpenter Report” would influence the defence policy of the subsequent Liberal government of Lester Pearson.

In the 18 June 1962 Federal election, Diefenbaker’s Progressive Conservatives won with less than 20,000 votes over Pearson’s Liberals, and his enormous 1958 victory was reduced to a minority government. Confusion over defence matters continued to plague the government, and this was readily apparent to most Canadians with the government’s inept response to the Cuban Missile Crisis in October 1962. The imbroglio continued with the public announcements of the

¹⁴³ DHH 73/1223, File 1863, Comptroller’s Briefing to Members of Air Council and Visiting AOCs on 1962-63 Budget Reductions, 11 July 1962, p. 2. A casualty of this reduction was the disbandment of No. 426 Squadron equipped with *North Star* transports that had gained the RCAF an admirable reputation with their service in Korea, Suez and the Congo. Originally, the squadron was to remain operational until 1965. Ultimately, the *North Star* aircraft continued in RCAF service in various roles until its retirement 8 December 1965.

¹⁴⁴ “AM Campbell Retires as CAS,” *The News and Eastern Townships Advocate, St John’s PQ*, 17 May 1962. <http://news.google.com/newspapers?id=wBUuAAAIBAJ&sjid=0CoDAAAIBAJ&pg=1918%2C3902007> [Accessed 28 January 2015]. Dunlap was to appointed AOC Air Defence Command in June 1951, but left in August to take up the National Defence College position.

retiring SACEUR, General Norstad and the US government in January 1963 regarding nuclear weapons, along with the ongoing dissension within Cabinet. In the meantime, the Liberal Party conducted a volte-face on its nuclear weapons policy with Pearson's famous Scarborough speech of 12 January 1963. The Liberal party perspective on nuclear weapons could be characterized, to paraphrase the words of Mackenzie King (on another defence topic), "nuclear weapons if necessary, but not necessarily nuclear weapons."¹⁴⁵

¹⁴⁵ McLin, p. 155. See also John English, *The Life of Lester Pearson, Volume II: 1949-1972 The Worldly Years*, Toronto: Vintage Books Canada, 1993, pp. 244-252 and John Munro and Alex I. Inglis (eds), *Mike: The Memoirs of the Right Honourable Lester B. Pearson, Volume 3, 1957-1968*, Toronto: University of Toronto Press, 1975, pp. 70-72.

Chapter 7

Twilight for Canadian Air Power - The Liberals Return 1963-1968

Introduction

The Pearson years should have represented a period of renewal and reappraisal for the Big Air Force concept, but, ultimately, other factors intervened. These included the confusion and chaos resulting from the integration/unification of the armed forces, and the continuing decline in defence expenditures exacerbated by the continuation of existing military commitments whilst introducing new military roles. The election of the Trudeau government in 1968 brought a defence review that confirmed the decline and foreshadowed the demise of the Big Air Force concept. Despite some small improvements in the air power equation (particularly in air transport), the overall result of the Liberal defence policies between 1963 and 1968 qualifies this period as a continuation of the “defence debacle.”¹ In terms of the three pillars of politics and economics, strategy and technology, the Liberal government proved to be more politically decisive than its predecessor. However, it was also constrained by fiscal realities that considered with the existing strategic and technological factors, limited the Liberal government’s freedom of action in the undertaking of a new policy direction.

The Liberal minority government elected in April 1963 fulfilled Pearson’s campaign promise by allowing the RCAF to equip its nuclear weapon delivery systems with their warheads in order to make them useful. By this time the United States, under the Kennedy administration,

¹ Though the Liberal government did undertake some defence reforms, including the refocusing of the armed forces with an emphasis on versatility and mobility, this new role was undertaken while existing alliance commitments continued, all in the face of declining defence expenditures and the absence of a clear defence strategy. The unification imbroglio initiated by Defence Minister Paul Hellyer simply added to the confusion. For the air force, the delivery of brand-new *CF-5* jet fighters directly from the Canadair production line to RCAF storage hangars (74 out of 115 aircraft) certainly represents a “defence debacle,” particularly when considering that the *CF-5* was the wrong aircraft to procure in the first place.

recognized the need for larger and better-equipped conventional armed forces to deal with "limited wars," an approach that resulted in a changed NATO doctrine of Flexible Response in 1967.² Flexible Response was based on the concept of maintaining sufficient conventional forces that would act as a tripwire in the event of Soviet aggression and only then would the use of nuclear weapons be considered. The Carpenter Report, as we have seen, had sketched out a non-nuclear future for the RCAF, including strategic and tactical transport in support of such missions as United Nations peacekeeping. Although these ideas had attracted little support in the Air Staff, they were in tune with approaches favoured by Paul Hellyer, the Liberal defence minister. His programme, however, was undercut by the declining defence budget.

Shrinking budgets hit hardest at capital funding, and essential support to the Canadian aircraft industry whose diminished capacity weakened the sustainability of the Big Air Force concept. This represented a great contrast to the heyday of the 1950s that had seen the Avro *CF-100* and *CF-105*, and the Canadair *Sabre*, *North Star*, *Yukon* and *Argus*. During the period 1950-1958, Canadian industry had produced 1,815 *Sabre*, 692 *CF-100* and 656 *T-33* jet aircraft, a total of 3,163 aircraft. In comparison, during the period 1961-1974 production consisted of 340 *CF-104/F-104G*, 240 *CF-5* and 210 *Tutor* jet aircraft for a total of only 790 aircraft. The production of military jet aircraft then ceased with the completion of Canadair *CF-5 Freedom Fighter* production in 1974.³ David Golden, President of the Air Industries Association of Canada, was

² Flexible Response was contained in NATO MC 14/3 and MC 48/3. See Jane E. Stromseth, *The Origins of Flexible Response: NATO's Debate over Strategy in the 1960s*, New York: St Martin's Press, 1988, Chapters 2 and 9 for both the background and the eventual outcome of the flexible response debate. See also Tom Keating and Larry Pratt, *Canada, NATO and the Bomb: The Western Alliance in Crisis*, Edmonton: Mel Hurtig Publishers Ltd, 1988, Chapter 3 – The Alliance and the Bomb.

³ Anthony L. Stachiw and Andrew Tattersall, *Canadair CF-5 Freedom Fighter*, St Catherines: Vanwell Publishing Limited, 2003.

more prophetic than he realized when in 1964 he testified that the outlook for the industry was uncertain.⁴

Defence Review 1963

Though defence issues had been in the public spotlight throughout 1962 and 1963, they were not at the top of the Pearson government's agenda.⁵ Under the new Liberal administration the defence budget accounted for less than twenty five per cent of federal expenditures compared to fifty per cent during St. Laurent's tenure.⁶

Hellyer, the minister, was a wilful individual with strong ideas. His appointment was to have dire consequences for the Big Air Force concept, though he is better remembered as the minister who instigated the unification of the armed forces. Hellyer's views on air power grew from his time at the Northrop Aeronautical Institute, his wartime RCAF service, his post-war experience as Associate MND and as the Official Opposition defence critic.⁷ Defence commentator John Gellner also influenced his views.⁸ Hellyer was opposed to the creation of a "nuclear-armed air force," and as Official Opposition defence critic, Hellyer had been a vociferous opponent of the *CF-104* and the strike-reconnaissance role for the Air Division. He distrusted the senior Air Force leadership, a perspective that was to determine his approach to re-

⁴ David Golden Testimony, Special Committee on Defence: Minutes of Proceedings and Evidence, No. 23, House of Commons, Second Session- 26th Parliament, 26 November 1964. Golden had been Deputy Minister in the Department of Defence Production in 1959 during the selection of the *CF-104* aircraft.

⁵ Robert Bothwell, *Alliance and Illusion: Canada and the World, 1945-1984*, Vancouver: UBC Press, 2007, p. 180.

⁶ *Ibid.* It was not only the decline in defence spending as a portion of the federal budget, but also the absolute decline in defence spending as a portion of GNP. See *Interim Report of the Special Committee of the House of Commons on Matters Relating to Defence*, Ottawa: House of Commons Canada, 20 December 1963, p. 12. Defence expenditures represented 24.5 % in 1963 and 23.9% in 1964 of total federal government expenditures.

⁷ See Paul Hellyer, *Damn the Torpedoes: My Fight to Unify Canada's Armed Forces*, Toronto: McClelland and Stewart Inc, 1990. See also Raymond Stouffer, "Cold War Air Power Choices for the RCAF: Paul Hellyer and the Selection of the CF-5 Freedom Fighter," *Canadian Military Journal*, Vol. 7, No. 3, Autumn 2006.

⁸ *Ibid.*

equipment of the RCAF.⁹ Rather than acquiescing to the RCAF leadership's desire to acquire new and expensive multi-role combat aircraft, Hellyer preferred spending the limited DND capital resources on an increased number of transport aircraft and a more simple ground support aircraft suitable for operations in Third World conflicts but for not fighting in the NATO Central Region in Europe.¹⁰

To present the new minority government in a positive light as a government that got things done, there were the "60 days of decision" after the Liberals assumed power in March 1963, including addressing a number of outstanding defence issues.¹¹ An early undertaking was the necessary negotiations with the US government for the acquisition of the nuclear warheads for the delivery systems already procured. The *BOMARC* was the first weapons system to receive its warhead by 31 December 1963, while the *CF-104s* in the Air Division and the Air Defence Command *CF-101* interceptors received their nuclear weapons during 1964.¹²

The new government also conducted an internal Defence Review under the leadership of Dr. R.J. Sutherland, Chief of Operational Research at the Defence Research Board.¹³ An early submission by Dr. Sutherland on 5 July 1963 reviewed the RCAF proposal recommending the procurement of sixty-six additional *CF-104* aircraft at a cost of \$91 million to offset attrition losses and maintain the Air Division at an operational strength of eight squadrons with 144

⁹ Hellyer, p. 34.

¹⁰ Ibid.

¹¹ John English, *The Worldly Years: The Life of Lester Pearson Volume II: 1949-1972*, Toronto: Alfred A. Knopf Canada, 1992, pp. 270-271.

¹² Ibid. Part of the Liberal Party platform had been to negotiate to obtain the nuclear weapons in order to meet Canadian commitments as implied by the acquisition of these various nuclear delivery weapons systems, but then to also negotiate Canada out of being nuclear-equipped. In the case of the *CF-104* and *BOMARC*, this was achieved in 1972, but the *Genie* nuclear rockets carried by the *CF-101* continued in service until retired in 1984.

¹³ The other Ad Hoc Committee members consisted of A.C. Grant, DM's staff, Captain V.J. Wilgress, RCN, Brigadier D.A.G. Waldoock, Canadian Army, Group Captain J.K.F. MacDonald, RCAF and Group Captain C.H. Mussells, RCAF.

aircraft.¹⁴ The study noted that strike forces were limited by the vulnerability of their airfields to Soviet missile attacks and the vulnerability of low-flying aircraft to air defences. No alternative equipment for the Air Division would be available before 1969, and it was thought that after this period, a replacement for the strike role would consist of MRBMs or V/STOL aircraft not dependent on airfields. Airfield vulnerability was not a new issue as the Chairman, Chiefs of Staff Committee, General Foulkes, had raised it back in 1959 when the selection of the strike-reconnaissance aircraft was under discussion.¹⁵

The *Report of the Ad Hoc Committee on Defence Policy*, referred to as the Sutherland Report, was submitted to the government on 30 September 1963.¹⁶ The Report suggested that there was no logical rationale for the existing size of the defence budget, noting that it had peaked during the defence build-up of 1951-54 and had been in decline ever since.¹⁷ It was the Report's view that Canadian strategy had been essentially based on alliance planning resulting in a force structure aimed at fulfilling alliance commitments.¹⁸ As well, the Report noted that the defence of Canada had to be considered within the context of the defence of North America, as there was no separate threat against Canada.¹⁹ Priority issues for the RCAF included replacement aircraft for the *CF-101* and the *Argus* during the 1968-73 timeframe and for the *CF-104* during

¹⁴ *The CF-104 Follow-On Order*, 5 July 1963.

¹⁵ DHH 73/1223 Series 3, Subseries 14, Box 103, File 2008B, Record of Proceedings of the 1962 Conference of Air Officers Commanding and Air Officers, 27 February – 1 March 1962, Appendix A – VCAS Address to AOC Conference on Current Plans and Programmes of the RCAF, p. 3. A year earlier at the annual AOC Conference in 1962, the Vice-Chief of the Air Staff, Air Vice Marshal D.M. Smith had briefed on a requirement for additional ninety *CF-104s* consisting of sixty-six single and twenty-four dual aircraft to meet attrition requirements. See also David Bashow – on *CF-104 losses*. The RCAF lost a total of 110 *CF-104s* in “Category A” accidents between 1961 and 1986 resulting in thirty-seven pilot fatalities, this represented 46% of the total of 238 *CF-104* aircraft in RCAF service. For the first five years after the Air Division was completely re-equipped with the *CF-104* in 1964, the losses were fifty-five aircraft. By 1973, ten years after the formation of the first *CF-104* squadron, total losses were eighty-one aircraft.

¹⁶ DHH 73/1223, Series 4, File 2099, *Report of the Ad Hoc Committee on Defence Policy*, 30 September 1963 (the “Sutherland Report”).

¹⁷ *Ibid.*

¹⁸ *Ibid.*

¹⁹ *Ibid.*

the 1969-72 timeframe.²⁰ Air defence system modernization was another issue that needed to be considered during the 1970s.²¹

The Sutherland Report determined four options for a future Canadian NATO commitment to Europe – the status quo plus evolution in the Central Region, withdrawal from Europe, continued participation in European defence using Canadian based forces and, lastly, continuing to base forces in Europe, but assuming a Central Region reserve role or SACEUR mobile force role.²² In the first option, cost was a major concern with the need to re-equip both the army brigade and air division starting in the late 1960s.²³ In the case of the air division, a strike reconnaissance replacement for the *CF-104* could not be justified in terms of cost or effectiveness, so that the only remaining practical alternative was seen as the adoption of a tactical support role using the same aircraft that could be operated for air defence in Canada.²⁴ The second option, withdrawal from Europe, also considered a partial withdrawal, either of the air division or the brigade. In the case of the air division, it was suggested that its impact would be lessened if withdrawn in 1972 at the end of the expected service life of the *CF-104*.²⁵ The third and fourth options introduced the concept of a mobile force and its possible application. The mobile force concept had been the subject of discussion in the armed forces for several years based on the perception that future conflicts in the Third World might require some type of intervention force, along with allied developments and Canadian UN experience.²⁶ In the case of

²⁰ Ibid.

²¹ Ibid.

²² Ibid. p. 88.

²³ Until 1968, the army commitment consisted of one brigade based in Germany as part of the British Army of the Rhine, with two additional brigades in Canada earmarked to be deployed overseas to form a division. A fourth army brigade in Canada was for defence of Canada tasks and UN operations.

²⁴ Sutherland Report, p. 98, The Carpenter Report had made a similar recommendation.

²⁵ Ibid. p. 115.

²⁶ Sean M. Maloney, ““Global Mobile””: Flexible Response, Peacekeeping and the Origins of Forces Mobile Command, 1958-1964, *The Army Doctrine and Training Bulletin*, Vol. 3, No. 3, Fall 2000, pp. 22-26.

the third option, the merits of both a light and heavy mobile force based in Canada were considered. A lightly armed mobile force, though it would be more easily air transported to Europe, would lack a medium armour capability, as tanks could not be airlifted, making such a contribution to the Central Region of limited military value.²⁷ A heavily armed force, though militarily useful, would incur high costs in order to provide either the necessary sealift or equipment stockpiling.²⁸ The magnitude of the airlift problems associated with the mobile force was a central issue; to move a division with only their personal weapons and equipment in thirty days would optimistically require a minimum of ten *Yukon* and thirty-eight *Hercules* transports.²⁹ The commitment of a Canadian-based brigade sized mobile force to reinforce the Northern Flank was also discussed, but was dismissed as being militarily high risk and politically unacceptable.³⁰ The report did not see a UN role for the mobile force, believing that the UN would not accept Canadian fighting troops, and any Canadian contribution to UN forces could be achieved from the existing force structure.³¹ The proposed RCAF component of the Canadian-based mobile force was based on a wing of three squadrons of *F-4C Phantom* fighter-bombers each of eighteen aircraft, a wing of three squadrons of Grumman *Mohawk* battlefield support/counter-insurgency aircraft each of eighteen aircraft, and a wing of two *C-130 Hercules* transport squadrons each of twelve aircraft.³² The *F-4C Phantom* aircraft represented the high end of a possible tactical fighter contribution to a mobile force, an issue that was to become a critical one

²⁷ Sutherland Report, p. 119.

²⁸ Ibid. pp. 129 and 139. For a division, dedicated sealift costs were estimated at \$300 million and \$465 million to stockpile the equipment and supplies in Europe.

²⁹ Ibid. pp. 126-127. At this time, the RCAF had only four *Hercules* aircraft; an additional thirty-four aircraft would cost an estimated \$120 million.

³⁰ Ibid. pp. 136-137. However, Canada did adopt this role in 1968 with the CAST (Canadian Air-Sea Transportable) brigade role.

³¹ Ibid. p. 89. This view was based on the Canadian experience in UNEF and UNOC that peacekeeping contributions would consist of logistics, communications and air transport units. However, for Cyprus in 1964, this was the exception where Canada provided an infantry battalion, an armoured reconnaissance squadron and a brigade headquarters. The Canadian Army maintained an UN Standby Force during this period based on an infantry battalion.

³² Ibid. pp. 119-120.

for the RCAF. In the fourth option, the notion of a light mobile land force based as a theatre reserve in the Central Region was not viewed as a viable military commitment. Within this option, another alternative considered a contribution of European based Canadian land and tactical air forces to Allied Command Europe Mobile Force - Land, AMF (L) and Allied Command Europe Mobile Force – Air, AMF (A). The AMF (L) and AMF (A) were intended to operate on the NATO Northern and Southern flanks to demonstrate Allied solidarity rather than as a fighting force; a purpose for which lightly equipped land forces were considered suitable. The contribution of a battalion or even a brigade was considered possible, but not a division, for political, military and logistics reasons.³³

The Report stated,

The proposition that Canada can best contribute to the defence of the NATO area by participation in a strategically mobile force is an extremely attractive one. This is the role which is most compatible with Canada's position as a North American nation and with Canada's other responsibilities for the Defence of Canada and support to the United Nations. There is every reason to suppose that this should be Canada's basic long-term objective and that no opportunity should be lost to move in this direction.³⁴

The musings regarding the application of a Canadian mobile force in the Sutherland Report were based on an imprecise attempt to reconcile various aspects of Canadian defence – the desire to contain costs, dissatisfaction with the nuclear role, the notion that Canadian forces were overly specialized in their alliance commitments and lacked flexibility for other roles, a desire for compatibility between European and Canadian based land forces and a single multi-role fighter for both NATO and NORAD roles, the attraction for the peacekeeping role, and a desire to have more integrated links between air and land forces. The mobile force concept was viewed as an attractive alternative, but the practical attainment of these objectives was not founded on a sound

³³ Ibid. Section XI – Contribution to SACEUR's Mobile Force. Ultimately, in 1964, Canada contributed two battalions to the AMF (L) from its home-based forces, this being reduced to one battalion in 1968.

³⁴ Ibid. p. 159.

strategic basis.³⁵ Hellyer envisaged a mobile force of division size supported by its own air transport and tactical fighters.³⁶ Hellyer's vision of the mobile force was a flawed one that was never clearly articulated, as he called for both a mechanized heavy force and some airborne capability to undertake such disparate roles as a "mobile reserve of the Supreme Allied Commander in Europe or serve in a United Nations operation...."³⁷

An all-party House of Commons Special Committee on Defence commenced its broad review of defence matters in June 1963 continuing until the end of 1964.³⁸ In the case of the RCAF, one of the Committee's recommendations was a review of the merits for a dual nuclear and conventional capability for the *CF-104*, a recommendation that was endorsed by the government's Defence White Paper in 1964, but not implemented until 1972. Other recommendations included a study to determine the most suitable role for the Air Division when the *CF-104* became obsolete, including consideration of assigning the air transport role to the Air Division.³⁹ In the case of Air Defence Command, the Committee recommended that, "as long as attack by enemy bombers remains a continuing threat, though of a diminishing nature, Canada must share in the defence against that threat."⁴⁰

³⁵ Sean M. Maloney, "Global Mobile II" The Development of Forces Mobile Command, 1965-1972, *The Army Doctrine and Training Bulletin*, Vol. 4, No. 2, Summer 2001, p. 17 "Foulkes was concerned about the direction Hellyer and Allard was going. It was one thing to increase the mobility of the two Canada-based brigades so they could get over to Europe. It was quite another to employ them in "this world-wide pacification role." As Foulkes put it, "The question of this free-wheeling, globe-spanning, trouble shooting role bothers me a bit."

³⁶ Maloney, "Global Mobile": Flexible Response, Peacekeeping and the Origins of Forces Mobile Command, 1958-1964, pp. 28-29. A Mobile Force Committee to examine this concept operated August-November 1963, while a separate Joint Service Study Group operated concurrently to examine strategic airlift.

³⁷ *Ibid.* p. 28.

³⁸ The Special Committee on Defence has also been referred to as the Sauvé Committee after its first chairman, Maurice Sauvé, who was replaced by David Hahn in 1964. See also Andrew Brewin, *Stand on Guard: The Search for a Canadian Defence Policy*, Toronto: McClelland and Stewart Limited, 1965. Brewin was the New Democratic Party member on the committee.

³⁹ Special Committee on Defence Interim Report, p. 19.

⁴⁰ *Ibid.* p. 21.

Among the various expert witnesses to appear before the Special Committee were General (Retired) Charles Foulkes, former Chairman of the Chiefs of Staff Committee, Lieutenant General Guy Simonds, former Chief of the General Staff, and Wing Commander (Retired) John Gellner. These three witnesses advocated the adoption of an integrated mobile force for the armed forces with air power in a supporting role focused on air transport.⁴¹ Simonds, in particular, apart from emphasizing air transport, supported some aircraft for the ground support and reconnaissance functions, but not for the strike or air defence roles.⁴²

Defence White Paper 1964 and Afterwards

The Liberal government published its Defence White Paper in March 1964 that addressed a number of outstanding air power issues looking forward over the next ten years to 1974.⁴³ The White Paper confirmed there would be no procurement of additional *CF-104* aircraft to replace those lost through attrition, meaning there would be a reduction over time of the number of *CF-104s* available for operations.⁴⁴ The White Paper mentioned the acquisition of a “high performance aircraft” to conduct tasks ranging from “ground attack to air surveillance.” These aircraft would be capable of rapid deployment, allowing their stationing in either Canada or Europe. As well, there was a desire for the European based squadrons to be more directly involved in the support of Canadian ground troops.⁴⁵ It was also anticipated that the Canadian based squadrons would be available for the air defence role, “thereby eliminating the necessity of acquiring special aircraft for this purpose.”⁴⁶ These proposals were similar to what been proposed

⁴¹ Special Committee on Defence, Lieutenant General Guy Simonds Testimony, 17 October 1963, General Charles Foulkes Testimony, 22 October 1963, and Mr John Gellner Testimony, 24 October 1963.

⁴² Simonds Testimony, 17 October 1963.

⁴³ Paul Hellyer, *White Paper on Defence*, Ottawa: Queen’s Printer, 1964.

⁴⁴ *Ibid.* p. 22.

⁴⁵ *Ibid.*

⁴⁶ *Ibid.* p. 23.

in the 1962 Carpenter Report and Special Committee on Defence witness testimony. In conjunction with air defence, it was suggested that there would be a declining allocation of resources to the anti-bomber role, but the three *CF-101* squadrons would continue in their role for the life of the aircraft while the two *BOMARC* squadrons would be “operated as long as they form an integral and essential part of the NORAD system.”⁴⁷

The centrepiece of the White Paper was the creation of a mobile force to include both land and tactical air forces. The White Paper also announced the significant enhancement of air transport capabilities “in order to have the flexibility in circumstances where improved air strips are not available... a considerable augmentation of the “air truck” component of the air transport fleet is being undertaken.”⁴⁸ The rationale for expanding air transport capabilities, apart from the lift required for the mobile force, had been a lesson learned from previous UN peacekeeping experience in Suez in 1956 and the Congo in 1960. As the White Paper was released, the *Yukon* and *Hercules* aircraft of Air Transport Command enabled the rapid deployment of a Canadian contingent to the new UN force being established in Cyprus.

The White Paper was vague regarding the future of the RCAF Maritime Air Command. In the area of anti-submarine maritime forces where the command was making a substantial contribution, the White Paper noted that continuing studies were determining the most effective force mixed systems, including maritime aircraft.⁴⁹ Both the *Argus* and the *Neptune* maritime patrol aircraft were “nuclear capable” though no nuclear weapons were obtained for these aircraft. However, there was the issue of a fundamental change in their anti-submarine role from

⁴⁷ Ibid. The number of *CF-101* squadrons had been reduced from five to three with the disbandment of No. 410 Squadron at Uplands and No. 414 Squadron at North Bay in 1964.

⁴⁸ Ibid.

⁴⁹ Ibid. At this time, Maritime Air Command was at its peak strength, consisting of thirty-three *Argus* and twenty-five *Neptune* maritime patrol/anti-submarine aircraft, along with the RCN with its one aircraft carrier and a total of eighty-three *Tracker* shipboard anti-submarine aircraft.

hunting and destroying Soviet “wolf packs” of submarines to “offensive” operations against Soviet ballistic missile-launching submarines.

Equally disappointing was the uncertain future facing the Air Reserves. They were mentioned in less than a single sentence: “the Air Force Reserves have a role in support of ground forces in civil survival.”⁵⁰ The number of Auxiliary squadrons was reduced once again from ten to six squadrons equipped with Otter light transports.⁵¹ The Auxiliary personnel strength was reduced from 2,260 to 860 personnel in April 1964.⁵²

The government had commissioned separate studies on the future of the Reserve components of the services, with the Draper Report examining the future of the RCAF Auxiliary.⁵³ The Draper Report recommended that the Auxiliary have the specific role of army air support, though its current equipment limited its ability to perform this role.⁵⁴ The White Paper twisted the Draper Report recommendation by limiting the Auxiliary role to supporting the Army only for civil survival, a task of the Army Reserves.⁵⁵

Another false economy for the RCAF was the forced release of 500-trained aircrew in 1964, as it was considered that the air force had a surplus in the aircrew occupations. Shortly afterwards, the RCAF realized its miscalculations, and attempted to re-enlist those who had been

⁵⁰ Ibid.

⁵¹ No. 400 and 411 Squadrons at Downsview, No. 401 and No. 438 Squadrons in St Hubert, No. 402 Squadron at Winnipeg, and No. 418 Squadron at Edmonton. Re-equipment changed the aircraft Unit Establishment from four *Otter* and four *Expeditor* aircraft per squadron to six *Otters* per squadron. The RCAF footprint ceased in Calgary, Hamilton and Vancouver, with the disbandment of No. 403, 424, 442 and 443 Squadrons. See F.J. Hatch, “Salute to the Auxiliary,” *The Roundel*, Vol. 16, No. 3, April 1964, p. 13.

⁵² Ibid.

⁵³ Special Committee on Defence, Group Captain J.W.P. Draper Testimony, 13 August 1964.

⁵⁴ See Special Committee on Defence Report, 1964 Session. In fairness, the Committee had noted the high cost of re-equipping the Auxiliary for airlift or tactical support would be very high, this at a time when cutting costs was a priority. The Committee believed that the principal role of the Auxiliary should be to maintain the flying skills of ex-Regular Force pilots whose training had been obtained at great cost.

⁵⁵ The Suttie Commission had studied the role of the Canadian Army (Militia) resulting in the re-introduction of traditional combat arms units to replace the disastrous attempt to convert the organization into a rescue force to contend with the results of nuclear war.

released. Some aircrew did return, but the majority had already sought other avenues of employment.

Shortly after the release of the Defence White Paper, Air Vice Marshal Annis, the Vice Chief of the Air Staff, presented “The RCAF: 1964-1974” at the 1964 AOC Conference.⁵⁶ Annis’ presentation is revealing as it shows the RCAF senior leadership was still promoting the concept of a Big Air Force. He noted that the declining number of *CF-104s* in the Air Division would result in a reduction to four squadrons by January 1967 but with sufficient reserves of aircraft to enable them to continue in operation until 31 December 1969.⁵⁷ However, some fifty *CF-101 Voodoo* interceptors, which had a lower attrition rate than the *CF-104*, were expected to still be in service in 1970. Annis expressed his uncertainty whether or not the proportion of the defence budget allocated to the maritime forces, including Maritime Air Command, would remain the same after the White Paper. The Air Staff had now determined, however, that an *Argus* replacement would not be required to enter squadron service until 1979 thus providing some immediate relief to the RCAF capital budget.⁵⁸ Air Transport Command anticipated the procurement of an additional two to four *Yukon* transports along with the acquisition of several jet transports. Annis did note there was a concern that the procurement of the *Yukons* might hamper obtaining additional *C-130s* beyond the recently approved sixteen aircraft.⁵⁹ The roadblock to moving ahead on these acquisitions was the lack of funding. Overall, the RCAF was anticipating capital procurement of \$1.294 billion over the next ten years, of which \$712

⁵⁶ DHH 73/1223, File 2009, 1964 AOC Conference, Air Vice Marshal C.L. Annis, “The RCAF: 1964-74,” undated, but suspected to be May 1964. This presentation was rather prescient in its predictions.

⁵⁷ Ibid. p. 2. The Air Division was reduced to six squadrons in 1966, being reformed as No. 1 Canadian Air Group with three squadrons in 1970. A total of forty-three surplus *CF-104s* were sold to Denmark and Norway.

⁵⁸ Ibid. p. 7. The *CP-140 Aurora* arrived in 1980.

⁵⁹ Ibid. p. 8. No additional *Yukons* were procured, but eight additional *C-130* aircraft were acquired to bring the fleet up to twenty-four aircraft.

million would be needed to acquire the *F-4 Phantom* aircraft that was the preference of the RCAF as its next fighter aircraft.⁶⁰

A Special Meeting of the Air Members held on 12 June 1964 considered the RCAF programme for 1965-66 and looked ahead over the next five years to FY1969-70. Annual budget expenditures for the Air Division were expected to decrease from \$84 million in 1964-65 to \$43 million in 1969-70.⁶¹ The allocation for Maritime Air Command SACLANT forces was expected to remain constant. A significant increase was anticipated in Air Defence Command starting in 1966-67 and continuing onwards representing about 23 per cent increased expenditures in 1969-70 with most of the funds to be allocated to the procurement of the 108 “*F-4* type” aircraft that could be employed either for the air defence or tactical fighter roles.⁶² Air Transport Command was another growth area, where it was expected the budget would jump from \$83 million in FY 1964-65 to \$115 million in FY 1965-66, after which a gradual decline would result in an annual expenditure of \$72 million in FY 1969-70.⁶³

The overall RCAF budget was expected to remain constant at approximately \$662 million, but there were anticipated reductions in the personnel, operations and maintenance categories from \$541 million to \$498 million by FY 1969-70.⁶⁴ These reductions were expected to allow some limited growth in the capital budget from \$130 million to \$167 million by FY 1969-70. Changing RCAF personnel strengths also indicated the trends in priorities. A reduction of 4,000 members from the 1964-65 RCAF Regular Force strength of 51,135 was anticipated to achieve

⁶⁰ Ibid. p. 8. \$288 million was spent to procure 115 *CF-5* aircraft during this period.

⁶¹ DHH 73/1223, File 1965, S000-115-65 (CAS), 1 June 1964, – RCAF Defence Programme 65-66, Special Meeting for Air Members, 12 June 1964.

⁶² Ibid. pp. 22 and 30. Note the reduction in the requirement for new fighters from 217 to 108 aircraft, though this most likely represented the initial buy rather than the total requirement.

⁶³ Ibid. p. 4.

⁶⁴ Ibid. p. 6.

47,135 by 1966-67, a number that was expected to remain stable thereafter.⁶⁵ In the case of the Air Division, its strength of 5,111 personnel in FY 1964-65 was to decline to 3,711 personnel by FY 1967-68.⁶⁶ For Maritime Air Command, its strength was to be reduced from 4,205 to 3,795 by FY 1965-66.⁶⁷ A small increase in Air Defence Command was anticipated, from 11,491 to 11,951 personnel.⁶⁸ In the event, RCAF personnel reductions were considerably greater than the Air Staff had anticipated, resulting in a personnel strength to 45,000 by 1966, 43,500 in January 1968, and 42,700 in 1969 prior to the major military manpower cuts imposed by the Trudeau government.⁶⁹

The New Tactical Aircraft

The announcement of the procurement of a new tactical aircraft proved to be the most contentious issue of the Defence White Paper.⁷⁰ Previously, in April 1963, the Air Staff had recommended 288 McDonnell Douglas *F-4C Phantom* aircraft at a cost of \$837 million.⁷¹ As noted, the acquisition of the *F-4* remained an issue during 1964. There was an unsolicited proposal from Canadair to license-build 108 *Rolls-Royce Spey*-powered *F-4 Phantoms* for the RCAF to replace the *CF-104*.⁷² The *Spey*-powered *Phantom* being built for the RAF and RN was an upgrade from the original USAF version, the *F-4C Phantom*, once considered as a contender for the strike-reconnaissance role in 1958, but eliminated due to its high cost and

⁶⁵ Ibid. p. 7.

⁶⁶ Ibid. p. 9.

⁶⁷ Ibid. p. 17.

⁶⁸ Ibid. p. 21.

⁶⁹ See *The Military Balance*, Volumes 66, 68 and 69, International Institute for Strategic Studies, Taylor & Francis Strategic Defence and Security Studies Archive [accessed 21 February 2015].

⁷⁰ DHH 73/1223, Series 1, File 214, Equipment RCAF – Tactical Aircraft, NSS 8885-12 S 1038-180 HQS 2100-15-1 (OPRED/DGFD) 4 September 1964, Revised Tactical Air Staff Requirements.

⁷¹ Air Staff/COR recommendation, RG 2 Volume 2749 (NAC), as quoted in Raymond Stouffer, “Cold War Air Power Choices for the RCAF: Paul Hellyer and the Selection of the CF-5 Freedom Fighter,” *Canadian Military Journal*, Vol. 7, No. 3, Autumn 2006, p. 66. Note differences in both numbers of aircraft and their cost.

⁷² Ibid.

developmental status at the time. The *Phantom* continued to represent the benchmark for a desired RCAF aircraft as its characteristics mirrored the multi-purpose aircraft proposed in the Carpenter Report two years earlier. Speaking of the new tactical aircraft at the AOC Conference in May 1964, Annis commented that “As I imagine you already know our choice was the McDonnell F4.”⁷³

RCAF support for the *F4 Phantom* was based on its capability, not only to provide close air support to ground troops, but for the air superiority and interception roles. The RCAF planned force structure was to establish eight squadrons by 1972 with the procurement of 217 *F-4 Phantom* aircraft, based on an allocation of either four squadrons for NATO and four squadrons for NORAD, or two squadrons for NATO and six squadrons for NORAD.⁷⁴ In terms of its flexibility, the *F-4* made imminent sense as it could be utilized in the strike-reconnaissance for the Air Division and for air defence with Air Defence Command at home. In addition, it fulfilled the requirements for the new tactical aircraft to provide battlefield close air support and reconnaissance.

The major drawback was its relatively high cost at \$3 million per aircraft compared to \$1 million for the *F-5* aircraft. With \$215 million allocated to the new tactical fighter programme, approximately sixty *F-4* aircraft could be procured compared to 115 *CF-5* aircraft. The RCAF did not hide its preference for the *F-4* to fulfill the tactical aircraft role, however, the government, and particularly Defence Minister Paul Hellyer had a different focus that emphasized an inexpensive approach. At Hellyer’s direction, the *F-4* was ruled out and the tactical aircraft competition was limited to four aircraft – the McDonnell Douglas *A-4E Skyhawk*,

⁷³ DHH 73/1223, File 2009, 1964 AOC Conference, Air Vice Marshal C.L. Annis, “The RCAF: 1964-74,” undated, but suspected to be May 1964.

⁷⁴ Stouffer, p. 6.

the Grumman *A-6A Intruder*, the Ling-Temco-Vought *A-7A Corsair II* and the Northrop *F-5 Freedom Fighter*.⁷⁵ The *A-4* was a proven specialized attack aircraft in service with the US Navy (USN) and Marine Corps (USMC). The *A-6* was also in service with the USN and USMC. The *A-7* was a new attack aircraft destined for both the USN and USAF. The Northrop *F-5* had been trialled by the USAF in Vietnam but not adopted by that service.⁷⁶ In 1958, while still at the developmental stage, the *F-5* had been proposed and rejected for the NATO strike role. The *F-5* was intended primarily to provide Third World air forces with a simple supersonic air superiority fighter with a limited air-to-ground capability.

The staff recommendation submitted on 15 February 1965 rated the *A-7A Corsair II* as the best option, with the *A-4E Skyhawk* second. The *A-6A Intruder* was dropped from consideration because of its cost and complexity, while the *F-5* was rated as not suitable.⁷⁷ The Chief of the Defence Staff, Air Chief Marshal Miller noted that the *CF-5* was ineffective for the air superiority role as it lacked radar, and it was equally unsuitable for the ground attack role as it lacked sufficient range when carrying a weapons load.⁷⁸ Depending on the variant of *F-5* to be selected, it was estimated that the number that could be purchased for the fixed cost of \$215 million varied between ninety and 126, the larger number being for variants of reduced capabilities.⁷⁹ The \$215 million budget for the *CF-5* represented only the cost of the aircraft, not

⁷⁵ DHH 73/1223, Series 1, File 214, Equipment RCAF – Tactical Aircraft, Memorandum from MND to CDS, 7 January 1965, Selection of a Tactical Aircraft. In this memo, Hellyer ruled out acquisition of the *F-4*, the selection being limited to the *A-4E*, *A-6A*, *A-7A* and *F-5*.

⁷⁶ The USAF adopted the *T-38* two-seat trainer version of the *F-5* aircraft.

⁷⁷ DHH 73/1223, Series 1, File 214, Equipment RCAF – Tactical Aircraft, 8001-1500-(COPR) 15 February 1965, Selection of a Tactical Aircraft. See 981-100 (D/COPR) 29 October 1964 Letter – comparison of *A-4* and *F-5*, and DHH 73/1223, Series 1, File 215, Equipment RCAF – Tactical Aircraft, 8001-1500 (ASec (COPR)) 21 June 1965, Tactical Aircraft – comparison of *A-7A* and *F-5*.

⁷⁸ DHH 73/1223, Series 1, File 215, Equipment RCAF – Tactical Aircraft, 8001-1500 (CDS) 7 June 1965, Letter from CDS to the Minister, Tactical Aircraft.

⁷⁹ DHH 73/1223, Series 1, File 217, Equipment RCAF – Tactical Aircraft, Letter from DM of Defence Production to DM, DND, 13 April 1966.

the total programme cost that Miller identified prior to the submission to the Cabinet as requiring an additional \$73 million for 125 aircraft, bringing the total programme cost of \$288 million.⁸⁰

It has been suggested that the procurement of the *CF-5* was as much based on Hellyer's vision of air power as the fiscal constraint of Finance Minister Walter Gordon.⁸¹ In the Memorandum to the Cabinet on the Selection of a Tactical Aircraft, Hellyer extolled the *CF-5* on the basis of three considerations:

- (a) The F5 is the only one of the three under consideration which has two engines and hence a higher survivability factor;
- (b) The F5 is the only one of the three which is supersonic and consequentially, has the best air-to-air combat capability at high altitudes;
- (c) The F5 could be modified for use as a supersonic trainer for the Canadian Forces, if this should become a requirement.⁸²

Miller's letter on 7 May 1965 to Hellyer in response to the minister's intransigence on procuring the *CF-5* rebutted the first two points.⁸³ In the case of the third factor, there was no requirement for such a trainer. Ultimately, the government announced on 15 July 1965 that up to 125 *CF-5* aircraft were to be license-built by Canadair. With the selection of the *CF-5*, the concept of employment for the tactical aircraft had to be revised to correspond with the limited capabilities of the *CF-5*.⁸⁴

⁸⁰ DHH 73/1223, Series 1, File 215, Equipment RCAF – Tactical Aircraft, 8001-1500 (CDS) CDS to DM, 8 July 1965, Tactical Aircraft – Selection (Aide-Memoire on the Implications of Tactical Aircraft Selection).

⁸¹ See DHH 73/1223, Series V, Box 113, File 2501, "History of Procurement CF-5 Aircraft and Tactical Aircraft Programs," Colonel W.H. Carsley, Project Manager for CF5/NF5, CF5 History of Events 1964-1971, 16 November 1971. See also Stouffer. See also Ross Fetterly, "The Influence of the Environment of the 1964 Defence White Paper," *Canadian Military Journal*, Vol. 5, No. 4, Winter 2004-2005. With an increased demand for social programmes by Canadians, there was constant pressure to reduce the defence budget despite the need for equipment replacement.

⁸² DHH 73/1223, Series 1, File 214, Equipment RCAF – Tactical Aircraft, Memorandum to the Cabinet, Selection of a Tactical Aircraft, 9 July 1965.

⁸³ DHH 73/1223, Series 1, File 215, Equipment RCAF – Tactical Aircraft, Letter dated 7 May 1965 from CDS to MND – Tactical Aircraft.

⁸⁴ DHH 73/1223, Series 1, File 214, Equipment RCAF – Tactical Aircraft, 8001-1500 (DAFCD) 30 July 1965, Concept of Employment CF5 Tactical Aircraft, DHH 73/1223, Series 1, File 218, Equipment RCAF – Tactical Aircraft, A Preliminary Paper on the Concept of Employment for the CF5 Aircraft in the Time Period 68-73, File V 11500NF-1 (DC Plans) 27 April 1966.

In the original concept of operations for the tactical aircraft, four *CF-5* squadrons were to be established, three operational squadrons each with eighteen aircraft to support the three Army brigade groups, and the fourth squadron with twenty-four aircraft to act as the Operational Training Unit.⁸⁵ The *CF-5* programme had planned the following squadron re-equipment: No. 408 Squadron, the Operational Training Unit, would be formed mid 1968 at Cold Lake, followed by No. 444 Squadron, the first operational squadron, to be formed at Namao late 1968, No. No. 434 Squadron was to be formed at Bagotville mid 1969, and the last squadron, No. 414 Squadron, forming at North Bay by 1970.⁸⁶ Hellyer approved this proposal “in principle,” with the caveat that he would make the final decision on the number of squadrons, along with the suggestion that there might be a better location in the Maritimes (i.e. Chatham) rather than North Bay. In anticipation of its new tactical role operating the *CF-5*, No. 408 Squadron had been reformed in 1964 at Rivers as a tactical support and reconnaissance unit equipped with the *T-33*. By February 1968, it was decided that only two squadrons would be authorized, No. 434 Squadron, was formed as the Operational Training Unit at Cold Lake on 15 January 1968 (though it later gained an operational role) and No. 433 Squadron was formed as a tactical fighter squadron on 26 September 1969 at Bagotville.⁸⁷

The acquisition of the *CF-5* raised controversy similar to that over the *CF-104* procurement in 1959. James Eayrs noted the exuberance of a contemporary recruiting advertisement,

The Super F-5 is just one of the many new exciting things that’s happening... in the Canadian Forces. Fast, versatile, and rugged, the Super F-5 is an ideal partner for

⁸⁵ DHH 73/1223, Series 1, File 219, Equipment RCAF – Tactical Aircraft, V 11500-NF-1 (DGAF), CF5 Squadrons – Identity and Locations, 21 June 1967.

⁸⁶ Ibid. The Operational *CF-5* squadrons were originally to be formed at Namao, North Bay and Chatham to be adjacent to their supported brigade groups, with the fourth *CF-5* squadron, as the Operational Training Unit at Cold Lake.

⁸⁷ Ward Mackenzie, ed. *434 Squadron History*, Belleville, 1984. Hangar Bookshelf, p. 93, and Dan Marchessault, ed. *433 Squadron History*, Belleville: Hangar Bookshelf, 1985, p. 45.

our ground forces. Operating from sod fields, it's deployed right up front where the action is, ready to step in and back up Canadian troops – with authority....”⁸⁸

Eayrs proceeded to comment that he had recently met a senior Northrop official who told him “that there was joy and amazement...in about equal proportions – joy that the Canadians had bought the *F-5* in such large quantities, amazement that we would have any useful purpose for it.”⁸⁹ At the time of the *CF-5* selection in 1965, a newspaper article by reporter William Neville wrote that Hellyer and other senior defence officials were launching a public relations programme to sell the *CF-5* to the Canadian Forces. Neville reported, “The *CF-5* supporters maintain the main criticism of the plane from a “handful of ‘big war’ exponents” who are opposed to Canadian purchase of any aircraft that does not have a nuclear bombing capability.”⁹⁰ Neville wrote that in the eyes of *CF-5* proponents such as Hellyer, the Vietnam War had proven that the selection of the aircraft had been the correct decision.⁹¹ The requirement for tactical support aircraft was justified on the grounds that the increased outbreak of Third World “brushfire wars” would necessitate more robust capabilities for UN air power beyond the traditional requirement for transport aircraft. The UN operation in the Congo had seen the deployment of combat aircraft by member nations, and experience there seemed to substantiate a requirement for a simple light attack and reconnaissance capability for UN air power.⁹²

⁸⁸ James Eayrs, “Military Policy an Middle Power: The Canadian Experience,” in J. King Gordon, (ed.) *Canada's Role as a Middle Power: Papers given at the Third Annual Banff Conference on World Development August 1965*, Toronto: Canadian Institute of International Affairs, 1966, p. 84.

⁸⁹ *Ibid.* p. 85.

⁹⁰ DHH 73/1223, Series 1, File 216, Equipment RCAF – Tactical Aircraft, William Neville, “ ‘Sell *CF-5*’ Campaign Launched in Services,” *Saskatoon Star-Phoenix*, 17 August 1965.

⁹¹ *Ibid.*

⁹² Walter Dorn, “The UN’s First “Air Force”: Peacekeepers in Combat, Congo 1960-1964,” *The Journal of Military History*, Vol. 77, October 2013. India had provided a small squadron of *Canberra* light bombers, while Sweden (*Tunnan*), Iran (*Sabre*) and Ethiopia (*Sabre*) had each provided a small fighter squadron in support of this operation.

Armed Forces Re-organization and the RCAF

The Liberal government's integration and then unification of the armed forces effectively broke up the air force and the other services as institutions, and thus greatly diminished the influence of advocacy for a Big Air Force within the defence establishment.⁹³ This re-organization did not take into account the real cultural differences that exist between the three armed services affecting tactical and environmental determinants in the conduct of military operations.⁹⁴ The first change was Bill C-90 that restructured National Defence Headquarters creating the Chief of Defence Staff appointment as the government's senior military advisor and doing away with the service Chiefs of Staff positions and the three service staffs. These changes resulted in an integrated Canadian Forces Headquarters (CFHQ) consisting of a single staff with senior officers from each service placed into various functional positions. Though there were RCAF officers who held various integrated appointments, there was no longer a professional head of the RCAF. For example, in February 1966, Air Chief Marshal Frank Miller was the Chief of the Defence Staff, and as such responsible for the whole of the Canadian Armed Forces. RCAF senior appointments in the four integrated CFHQ staff branches included Air Marshal Annis as the Chief of Technical Services, Air Vice Marshal Ball as Deputy Chief Plans, Air Vice Marshal Reyno as Deputy Chief Personnel and Air Commodore Whitby as Deputy Chief

⁹³ See Vernon J. Kronenberg, *All Together Now: The Organization of the Department of National Defence in Canada 1964-1972*, Wellesley Paper 3/1973, Toronto: Canadian Institute of International Affairs, 1973, and Douglas L. Bland, *Chiefs of Defence: Government and the Unified Command of the Canadian Armed Forces*, Toronto: Brown Book Company Limited, 1995. It is not my intention to become embroiled in the integration/unification debate of the 1960s, but there was an obvious impact on the institutional basis for the RCAF. This re-organization was also predicated on achieving economies in defence expenditures partly relating to the Royal Commission on Government Organization (Glassco Commission) and repairing civil-military relations that had become frayed during the last years of the Diefenbaker government.

⁹⁴ Bland, pp. 77-78. See also Allan D. English, *Understanding Military Culture: A Canadian Perspective*, Montreal and Kingston: McGill-Queen's University Press, 2004, and Air Marshal (Retired) W.A. Curtis Testimony to Special Committee on Defence, 9 June 1964.

Construction Engineering.⁹⁵ Within the new organization, the senior air force operations officer was now relegated to a Director General Air Forces, at the Air Commodore rank level.⁹⁶

The introduction of an integrated command structure for the Canadian Armed Forces in 1965 was another change that was to impact the RCAF in an institutional sense. The existing command structure of the three services based on a total of eleven functional and geographical commands was replaced with six integrated functional commands consisting of Mobile, Maritime, Air Defence, Air Transport, Training, and Materiel Command. The Air Defence and Air Transport Commands were merely a continuation of the previous RCAF commands, while an integrated Maritime Command for the RCN and RCAF had been operational since 1959. No. 1 Air Division reported directly to CFHQ, rather than through a separate air force chain of command. In the field commands, the greatest change occurred with the establishment of Mobile Command that consisted of mobile land and tactical air forces in Canada.⁹⁷ The commander of the Mobile Command was an army officer, but there were two Deputy Commanders representing the army and RCAF, that reflected the initial importance assigned to tactical air support in the new Command.⁹⁸

In May 1967, Parliament passed Bill C-243, the *Canadian Forces Reorganization Act* that unified the three services into a single service, the Canadian Armed Forces. This act went

⁹⁵ CFHQ was re-organized four times in the first three years of its existence.

⁹⁶ Kronenberg. The senior RCAF officer for equipment requirements was now at the Air Commodore level within the Deputy Chief of Force Development.

⁹⁷ See Sean M. Maloney, ““Global Mobile:” Flexible Response, Peacekeeping and the Origins of Forces Mobile Command, 1958-1964,” *The Army Doctrine and Training Bulletin*, Vol. 3. No. 3, Fall 2000, and ““Global Mobile II:” The Development of Forces Mobile Command, 1965-1972,” *The Army Doctrine and Training Bulletin*, Vol. 4, No. 2, Summer 2001. The Air Division and the Brigade Group in Europe reported directly to CFHQ. It was only with their consolidation in southern Germany in 1970 that an integrated command was established as Canadian Forces Europe.

⁹⁸ Air Vice Marshal Carpenter was the first Deputy Commander Support, the senior RCAF position, in 1965, but this position soon disappeared, and a more traditional army command structure emerged. The senior air force position was then Commander 10 Tactical Air Group (a one-star position) who was also double hatted as Deputy Chief Air for Mobile Command Headquarters.

into effect on 1 February 1968. Though the act might not directly change the conduct of daily operations on the flight line or in the cockpit, there was a significant impact on the institutional air force that was downplayed or ignored. The organizational restructuring at both the strategic headquarters level and in the field commands violated a basic tenet regarding the centralized control of air power. The centralized control of air power ensured that a single air force commander would be provide the required “coherence, guidance and organization” in making the most effective use of air resources to accomplish objectives.⁹⁹ This “penny packeting” of air force resources destroyed this tenet and the absence of single authority that could speak on behalf of Canadian air power resulted in the emergence of various “air force communities,” – fighters, transport, maritime, and tactical aviation – that represented a fragmented, wasteful and incoherent approach to air power. This was a further nail in the coffin of the Big Air Force concept, and the cessation of any notion of “independent air power” in the Canadian context.

Within Mobile Command, a new formation, No. 10 Tactical Air Group (10 TAG), was established in September 1968 with the intention that it would consist of the four tactical fighter squadrons, *Buffalo* tactical transports, and light and heavy helicopters. In the interim, other 10 TAG units were formed commencing with No. 429 (Tactical Transport) Squadron established at St Hubert in August 1967 equipped with the *Buffalo*, with a detachment of four aircraft at Namao.¹⁰⁰ On 29 March 1968, No. 450 Heavy Transport Helicopter Squadron, equipped with the *CH-113A Voyager* transport helicopter, was formed at St Hubert while No. 403 Helicopter Operational Training Squadron equipped with the *CUH-1H Iroquois* utility tactical transport helicopter was also formed in

⁹⁹ Canada. National Defence. *Canadian Forces Aerospace Doctrine*, B-GA-400-000/FP-000, Trenton: Canadian Forces Aerospace Warfare Centre Production Centre, 2007, p. 30.

¹⁰⁰ The *Buffalo* was transferred from Mobile Command to Air Transport Command in 1970.

1968 at Petawawa.¹⁰¹ The *Voyageur* squadron had previously been the Canadian Army transport helicopter platoon, but the *Iroquois* acquisition was in anticipation of a planned tremendous increase in the size of the battlefield helicopter fleet as a result of the 1967 Helicopter Study.¹⁰² This study had recommended that the Canadian Armed Forces acquire four types of helicopter to support land forces: a light observation helicopter (LOH), a utility tactical transport helicopter (UTTH), a medium transport helicopter (MTH) and attack helicopters (AH). Subsequent assessments identified the following requirements: 107 LOH, 100 UTTH, eighteen MTH and twenty-three AH.¹⁰³ The eventual procurement fell far short because of budgetary constraints: only fifty Bell *CH-135 Twin Huey* UTTH, seventy-four Bell *CH-136 Kiowa* LOH and eight Boeing *CH-147 Chinook* MTH, and no attack helicopters.

In the case of Air Transport Command, the major re-equipment programme had been the replacement of the *C-119 Flying Boxcar* aircraft in No. 435 and No. 436 Squadrons with the *C-130E Hercules* during 1965. According to Hellyer, the RCAF senior leadership had been content to simply refurbish the *C-119* aircraft, but upon seeing for himself the extensive corrosion of the aircraft while undergoing maintenance at the De Havilland Canada plant in Toronto, Hellyer decided that the aircraft required replacement.¹⁰⁴ The *C-130E Hercules* acquisition provided a tremendous increase in RCAF air transport capability representing more than mere numbers of aircraft. The twenty-four *C-130E* and the twelve *CC-106* transports greatly expanded the airlift capacity of Air Transport Command, providing the RCAF with a long-range transport capability

¹⁰¹ "Military Affairs," *Flying Review International*, Vol. 23, No. 5, May 1968, p. 242.

¹⁰² DHH 73/1223 Box 11, File 187, File No. V 11520-1 (DLFORA) 18 May 1967, Helicopter Study. See Randall Wakelam, "Creating an Air Arm for the Canadian Army," *The Canadian Army Journal*, Vol. 15, No. 2, Autumn 2013.

¹⁰³ DHH 73/1223, Series 2, Box 50, File 923, Annex A to Minutes of CDSAC 3/70, 28 January 1970, Deputy Chief of Force Development Presentation to CDS Advisory Committee 28 January 1970 on Helicopter Programs.

¹⁰⁴ Hellyer, *Damn the Torpedoes*, pp. 74-75.

that was otherwise limited to the USAF and RAF. This new airlift capability enabled Air Transport Command to move an air transportable battalion group of 1,200 or more troops on light scales as part of the NATO ACE Mobile Force or a UN operation. (However, it was still a far cry from the estimated fifty *C-130* Hercules aircraft required to airlift a light brigade from Canada to Europe over a four week period.)¹⁰⁵ Air Transport Command again demonstrated its new capabilities with the emergency withdrawal of the 800 strong Canadian contingent with UNEF I in May 1967.¹⁰⁶

As the current *CC-106 Yukon* aircraft would reach the limit of their operational life by 1973, at the 16 May 1968 meeting of the DND Estimates Review Committee, Major General N.G. Wilson-Smith, the Deputy Chief Force Development, proposed that the *Yukon* be replaced with eleven Lockheed *C-141 Starlifter* jet transports during the period 1972-74 at a cost of \$175 million.¹⁰⁷ However, it was a missed opportunity, as no orders had been placed in 1967 before the production line closed down.¹⁰⁸ Apart from the obvious increase in airlift capabilities, the *C-141s* would have been a capable refuelling aircraft as the “C-141 could refuel four CF-5A fighters on transatlantic ferry from wing tanks while hauling 30,000-lb flyaway kits and other

¹⁰⁵ McLin, p. 201.

¹⁰⁶ See W.A.B. Douglas, “Canada and the Withdrawal of the United Nations Emergency Force,” *Canadian Defence Quarterly*, Vol. 2, No. 3, Winter 1972-73.

¹⁰⁷ DHH 73/1223, Series 4, Box 105, File 2103, 174th Meeting of the DND Estimates Review Committee Defence Review, 16 May 1968.

¹⁰⁸ DHH 73/1223, Series V, Box 113, File 2500F, S1151-4110/D1 (DSecDD (MM) 4 August 1967, Defence Council Presentations. At the 226th Defence Council meeting on 27 June 1967, approval had authorized for the purchase of four *C-141* and one *DC8* aircraft. See also *Flying Review International*, Vol. 22, No. 15, November 1967, reporting the acquisition of four *C-141* tanker-transport, while “Aeronews and Military Report,” *Air Progress*, Vol. 21, No. 2, August 1967 reported the procurement of ten *C-141* jet transports.

gear to operate fighters from overseas bases.”¹⁰⁹ The opportunity to obtain six additional *C-130* aircraft was also allowed to pass.¹¹⁰

New Fighter Aircraft – Missed Opportunities?

In the meantime, the air force officers at the new Canadian Forces Headquarters (CFHQ) had proposed a new fighter aircraft known as the Canadian Advanced Multi-Role Aircraft (CAMRA) as a possible replacement for the existing *CF-101*, *CF-104* and *CF-5* aircraft in the 1973-83 timeframe.¹¹¹ This programme had originated in 1966 under Air Commodore William Carr and Group Captain Hal Bridges.¹¹² Initial planning was based on a procurement of 250 aircraft to equip twelve operational squadrons.¹¹³ Interestingly, the CAMRA proposal referred to the *CF-5* as “an interim priority program not only to ensure close support...in the short term, but also to permit the Canadian Armed Forces to relearn and develop the skills and techniques of close air support.”¹¹⁴ In 1967, Northrop submitted a proposal for their *P.530 Cobra* lightweight multi-role fighter.¹¹⁵ Hellyer exerted pressure on the Chief of the Defence Staff, General Allard, urging that “the staff would be able to give this proposal to participate in Project 530 their early consideration...”¹¹⁶ There was pushback from the CDS, suggesting that procurement in 1973 was most unlikely, with 1975 being a more realistic timeframe. In the CDS’s words, “while their

¹⁰⁹ Ibid.

¹¹⁰ In 1970-71, five *Boeing 707* aircraft were procured to replace the *Yukon* transport, of which two were modified in 1972 as air-to-air refueling tankers. Five additional *C-130H* aircraft were acquired in 1975.

¹¹¹ DHH 73/1223, Series 1, File 219, Equipment RCAF – Tactical Aircraft, Annex A to V3510-6 (DAFORCF) 28 April 1968.

¹¹² Ron Pickler and Larry Milberry, *Canadair: The First 50 Years*, Toronto: CANAV Books, 1995, p. 258.

¹¹³ DHH 73/1223, Series 1, File 219, Equipment RCAF – Tactical Aircraft, Annex A to V3510-6 (DAFORCF) 28 April 1968.

¹¹⁴ Ibid. The notion that the *CF-5* was an interim “aircraft” along with the suggestion of a twelve combat squadron structure appears to have originated with Hellyer in a letter to the Minister of Defence Production, C.M. Drury, dated 26 May 1966.

¹¹⁵ DHH 73/1223, Series 1, File 219, Equipment RCAF – Tactical Aircraft, S 1151-4110/D1 TD .7157, 6 June 1967, Canadian Advanced Multi-Role Aircraft (CAMRA) – NORTHROP P530 Proposal.

¹¹⁶ DHH 73/1223, Series 1, File 218, Equipment RCAF – Tactical Aircraft, Memorandum dated 7 February 1967, Hellyer to CDS, Development of Project 530.

proposal makes a great deal of sense in relation to applicable Canadian requirements and possible consortium interest,” no firm commitment could be made until studies of other aircraft programs such as the Anglo-French Variable-Geometry (AFVG) aircraft, the USAF FX study and the NATO follow-on aircraft had been completed.¹¹⁷ The *Cobra* represented a significant advance over the *CF-5* aircraft, but the lack of customers ended its development.¹¹⁸ In March 1968, Defence Council put a hold on any future studies of the CAMRA project pending a review of the defence programme.¹¹⁹ At the same time, in May 1968 Canada became a member of a NATO working group consisting of the UK, West Germany, Italy, the Netherlands and Belgium examining a future fighter aircraft.¹²⁰ These meetings resulted in Memorandum of Understanding (MOU) being signed by Germany, the UK, Netherlands and Italy on 17 July 1968 with the intent of studying the *MRA-75* (Multi-Role Aircraft 1975) as a new fighter. Aircraft designs were based on twin-engines using variable-geometry wings.¹²¹ Under the terms of this MOU, Canada was allowed to participate for a further two months after which it would be subject to the MOU terms.¹²² The tone of the deputy minister’s letter on the subject seemed to reject further Canadian participation with the European group in favour of future linkages with the US.¹²³ Defence

¹¹⁷ DHH 73/1223, Series 1, File 218, Equipment RCAF – Tactical Aircraft, V 11500-1 TD 7041 (DAFOR(CF)), 20 February 1967, Memorandum from CDS to Minister, Development of Project 530.

¹¹⁸ DHH 73/1223, Series 1, File 219, Equipment RCAF – Tactical Aircraft, S 1151-4110/D1 TD .7157, 6 June 1967, Canadian Advanced Multi-Role Aircraft (CAMRA) – NORTHROP P530 Proposal. The *Cobra* project formed the basis for the US Air Force lightweight fighter competition as the *YF-17*, losing out however to the *YF-16*. The *YF-17* was then developed by the US Navy as the *F/A-18* and as the *CF-18* became the winning aircraft for the New Fighter Aircraft (NFA) programme in 1980. See Bill Gunston, *F/A-18 Hornet*, Shepperton: Ian Allan Ltd, 1985. For an examination of the Northrop *P.530 Cobra* programme, see “Cobra Concept: Recipe for Success?” *Air Enthusiast*, Vol. 3, No. 2, August 1972, and Fred Anderson, *Northrop: An Aeronautical History*, Los Angeles: Northrop Corporation, 1976, pp. 257-261.

¹¹⁹ DHH 73/1223, Series 2, File 903, Equipment RCAF – Tactical Aircraft, Defence Council 241-2, 12 March 1968.

¹²⁰ Bill Gunston, *Panavia Tornado*, Shepperton: Ian Allan Ltd, 1980, pp. 13-14.

¹²¹ *Ibid.* Canadair submitted its proposal, the *CL-236*, for consideration as the *MRA-75*, Pickler and Milberry, p. 258.

¹²² DHH 73/1223, Series 2, File 903, Equipment RCAF – Tactical Aircraft, D3505-A1/67(DM) 14 August 1968, Memorandum from DM to Defence Council, CAMRA Project (despite the subject heading, this memo referred to the NATO multi-role aircraft project).

¹²³ The VCDS response to the CDS on 18 August challenged the DM assertions as “mainly opinion, not fact.”

Council requested an extension beyond the two-month limit without signing the MOU in order to allow for an assessment before deciding on future participation.¹²⁴ However, this was a very short-lived involvement in the programme; Canada withdrew by October 1968.¹²⁵

The succession of Pierre Trudeau to the office of Prime Minister and his subsequent election in June 1968 was also to portend future changes to the role of air power in the new Canadian Armed Forces. One of his first actions as Prime Minister was to direct a Defence Review. In the case of the 1968 Defence Review, there were consistent themes affecting the future of Canadian air power.¹²⁶ First, there was the requirement to replace the *CF-101* and *CF-104* by 1974-75. Associated with the *CF-101* replacement, there was a requirement to modernize the air defence system. Second, there was the requirement to replace the *Argus* maritime patrol aircraft by 1973. Third, there was a requirement to modernize and increase air transport capabilities. However, these various programmes were to be delayed, similar to the case of the new fighter, for over a decade. The election of Trudeau heralded the new generation assuming power from that older generation of political leaders, Diefenbaker and Pearson, who had held power during the “air wars” of the past decade. Trudeau’s ascension to power also confirmed that the Big Air Force concept was finally put to rest.

¹²⁴ DHH 73/1223, Series 2, File 903, Equipment RCAF – Tactical Aircraft.

¹²⁵ DHH 73/1223, Series 2, File 903, Equipment RCAF – Tactical Aircraft, The Cabinet Committee on Priorities and Planning – Record of Committee Decision, 22 October 1968. The decision not to participate was confirmed by the Cabinet on 24 October 1968. This programme was to evolve into the successful *Tornado* Multi-Role Combat Aircraft (MRCA) for the UK, Germany and Italy. The MRCA was a candidate for the NFA in the late 1970s.

¹²⁶ DHH 73/1223, Series 4, Box 105, File 2103, Defence Policy and Program Review, 1968.

Epilogue

A new Defence White Paper in August 1971, *Defence in the Seventies*, reaffirmed the priorities set forth in the defence policy announcement of 3 April 1969.

- (a) The surveillance of our own territory and coastlines, i.e. the protection of our sovereignty;
- (b) The defence of North America in co-operation with US forces;
- (c) The fulfillment of such NATO commitments as may be agreed upon; and
- (d) The performance of such international peacekeeping roles as we may from time to time assume.¹

There was no pretence of maintaining the Big Air Force concept. Although the Canadian Forces still had a fleet of 1,080 aircraft, nearly sixty per cent were training and non-operational transport aircraft, many of them older types.² In 1970, No. 1 Canadian Air Group, the successor to No. 1 Air Division, consisted of two of nuclear-strike and one reconnaissance *CF-104* squadrons with fifty-four operational aircraft. As promised, the *CF-104* nuclear strike role was relinquished in January 1972, and the aircraft in the three squadrons were reconfigured for the conventional attack role. Compared to other conventional attack aircraft, however, the *CF-104* had a number of inherent limitations, a principal one being its limited ordnance load of 4,000 pounds. In Air Defence Command, the *BOMARC* nuclear-armed surface-to-air missiles were also withdrawn from service in 1972, leaving the *CF-101 Voodoo* interceptors as the sole remaining nuclear

¹ Donald S. Macdonald, *Defence White Paper – Defence in the 70s*, Ottawa: Information Canada, 1971. See Norman Z. Alcock et al, “Defence in the 70s: Comments on the White Paper,” *Behind the Headlines*, Vol. XXX, No. 7-8, Toronto: Canadian Institute of International Affairs, October 1971. In particular, see F.S. Carpenter who criticized the continuing allocation of resources to both anti-bomber defence and ASW. See also John Gellner, “Bold Statements but Little Money,” *Canadian Aviation*, Vol. 43, No. 10, October 1970 and John Gellner, “So much to do...so little equipment,” *Canadian Aviation*, Vol. 46, No.1, January 1973.

² *Canadian Aviation*, Vol. 46, No. 1, January 1973, pp. 30-31. With Canadian Armed Forces unification in 1968, there was no longer an “air force,” and the official term to denote those personnel engaged in “air force activities” was the “Air Element.” With the creation of Air Command in 1975, the unofficial use of the term, “air force” was now acceptable, albeit without the capitalization.

armed weapon system (*Genie* rocket) until its phase-out in 1984. The original surviving batch of *Voodoos* that had been obtained in 1961 was exchanged in 1971 for sixty-six upgraded aircraft. The assignment of No. 417 Squadron, the *CF-104* operational training unit, to an air defence role, simply represented “window dressing” rather than an improvement to air defence in Western Canada, let alone an effective use of the *CF-104* aircraft. The *CF-5* “tactical aircraft,” that had been a key element in the 1964 Defence White Paper, and originally viewed as representing the “New Look” of Canadian air power with four “global mobile” tactical fighter squadrons, was relegated to a minor role. The two *CF-5* squadrons that had been formed were assigned to NATO’s Allied Mobile Force (Air) on the Northern Flank in the tactical support role. They were also to provide “a quick-response photographic reconnaissance capability in Canada and over the waters off Canadian shores.”³ In 1970, trials were conducted to determine *CF-5* suitability for use in the NATO Central Region; however, the aircraft’s limitations confirmed that it could not be usefully employed in this theatre. Maritime Command continued to operate a reduced number of *Argus* maritime patrol aircraft that in addition to their ASW role now included additional tasks such as Arctic sovereignty patrols and non-military commitments such as pollution detection. The *Tracker* aircraft, previously operated from the aircraft carrier HMCS *Bonaventure* until its retirement in 1970, continued to operate from the naval aviation shore base, CFB Shearwater, in a short-range coastal patrol role. Air Transport Command, a major beneficiary of the 1964 Defence White Paper, underwent a limited modernization with the replacement of its twelve *Yukon* turbo-prop transports with five *CC-137* (*Boeing 707*) jet transports during 1970-71. Two *CC-137s* were adapted for air-to-air refuelling of the *CF-5* fighters for deployment to Norway. The acquisition of the five *CC-137s* was a far cry from the

³ *Defence in the 70s*, p. 18.

original plan to acquire eleven Lockheed *C-141 Starlifter* military jet transports (and possibly the giant Lockheed *C-5 Galaxy* transports) that had fallen through in 1967, an acquisition that would have provided considerable airlift and flexibility for the mobile force. The *CC-137* aircraft and the twenty-four *CC-130E Hercules* transports that had been acquired as a result of the 1964 White Paper were to remain the bulk of the Canadian Forces long-range airlift until the mid 1990s.⁴ However, the fifteen *Buffalo* tactical transports that had entered service in 1967 as a battlefield transport with Mobile Command had a very short period of service in this capacity with their transfer to Air Transport Command in 1970 for the Search and Rescue role and for transport duties with the United Nations. Within 10 TAG of Mobile Command, the tactical aviation elements experienced a tremendous expansion by 1975, though considerably less, as we have seen, than projected in the original 1967 concept. A total of seven squadrons were established with the procurement of 132 light observation, utility and medium transport helicopters; no attack helicopters had been acquired.⁵ The Canadian Forces Air Element had achieved some limited modernization by the early 1970s, but its size and importance were greatly diminished. More significantly, there was no strategic rationale for the organization and function of the various air components of the unified Canadian Armed Forces. The Air Element had no independent role, but rather supported the other commands or carried out alliance commitments. The three-year defence budget freeze at a time of high inflation had a devastating effect on the Air Element in the early 1970s with greatly reduced flying hours and aircraft in

⁴ There had been some additional small procurement to increase the *Hercules* fleet size and offset attrition losses: 1974-75 - four *C-130H*, 1985-86 - 3 *C-130H*, 1991 - five *C-130H* and 1997 - two *C-130H-30*. Discounting losses, the fleet amounted to 32 aircraft by this time, though the intent had been to increase the fleet to 45 aircraft. Between 1967 and 1993, RCAF *C-130* attrition amounted to five *C-130E* and three *C-130H* aircraft (Source: Martin W. Bowman, *Lockheed C-130 Hercules*, Ramsbury: The Crowood Press Ltd, 1999). The *CC-137* was retired in 1997 replaced by a similar number of *CC-150 Polaris (Airbus A310)* aircraft.

⁵ Brian Northrup, "In Direct Support: Canada's Military Helicopters," *Proceedings of 5th Annual Air Force Historical Conference/36th CAHS Annual Convention*, 16 Wing Borden, Ontario, June 1999, Winnipeg: Office of Air Force Heritage and History, 1999. See also I.R. Binney, "The Helicopter in the Canadian Forces," *Canadian Defence Quarterly*, Vol. 1, No. 3, Winter 1972.

service. For example, the number of operational *Voodoo* aircraft was cut from forty-four to thirty-six aircraft and the number of *Argus* aircraft from thirty-two to twenty-six.

The more vitriolic critics tend to blame everything on Trudeau, but most difficulties with the Canadian Forces in the late 1960s, including those of the Air Element, originated in the decisions of previous governments.⁶ A basic difficulty was inadequate funding as a result of cuts in the defence budget since the mid-1950s. Capital equipment expenditures in the defence budget had fallen to thirteen per cent in 1966, and with the 1969 three-year budget freeze, the equipment portion fell further to eight per cent by 1972. The Trudeau government's re-ordering of defence priorities only five years after they had been previously re-arranged greatly added to the confusion that continued from the upheavals during Hellyer's tenure as Defence Minister. Moreover, within five years of the changes announced by Trudeau in April 1969, defence policy had come full circle with the re-emphasis on NATO in the mid-1970s onwards.⁷ In addition, the rather muted support for peacekeeping in 1969 was resurrected with new commitments by 1973.⁸ The top priority, the protection of national sovereignty, remained a dubious one.⁹ Expensive equipment that had been procured for warfighting roles was utilized without the necessary modifications for surveillance purposes. Indeed, senior military officials did not "buy" into the

⁶ See Gerald Porter, *In Retreat: The Canadian Forces in the Trudeau Years*, Ottawa: Deneau and Greenberg Publishers Ltd 1978. Porter was a journalist and Naval Reservist whose book was based on his Master's degree in Journalism from Carleton University. The book's jacket describes the volume as "a chilling account of ignominy without battle, defeat without war, *In Retreat* rebukes the Trudeau government for reducing the Canadian Armed Forces to a position in which they 'are no longer capable of performing the major defence tasks assigned to them'." J.L. Granatstein in *Who Killed the Canadian Military?* Toronto: HarperCollins Publishers Ltd, 2004, noted, "Without a doubt Pierre Trudeau killed the Canadian Forces." (p. 124) See also Bob Plamondon, *The Truth About Trudeau*, Ottawa: Great River Media Inc, 2013, Chapter 4, "At War With the Canadian Military."

⁷ R.B. Byers, "Defence and Foreign Policy in the 1970s: The Demise of the Trudeau Doctrine," *International Journal*, Vol. xxxiii, No. 2, Spring 1978.

⁸ This included UNEF II in 1973 and UNDOF in 1974. With the exception of Cyprus, these reflected the "traditional" Canadian peacekeeping commitments – observers, logistics, signals, and air transport. During the Mulroney years, an additional peacekeeping task was the provision of a squadron of *Twin Huey* UTTH to the MFO in the Sinai 1985-90.

⁹ J.L. Granatstein wrote, "Sovereignty is a fraud, a patently phony defence priority." "Defence in the 70s: Comments on the White Paper," p. 12.

sovereignty protection role as a legitimate military function. The only nation in a position to challenge Canadian sovereignty was the United States – and therefore the use of military force remained a moot point.

The Defence Structure Review in 1974, apart from bringing increases in defence spending also reversed some policies set forth in the 1971 White Paper. A Request For Proposals (RFP) in 1973 brought four responses to replace the *Argus* with a modern Long Range Patrol Aircraft (LRPA).¹⁰ By December, the choice had been narrowed to a version of the Lockheed *P-3C Orion* or the *Boeing 707*.¹¹ At this stage, the LRPA programme almost came apart as industrial offsets were assigned a higher priority than the provision of an aircraft that could meet the military requirements.¹² A budget ceiling of \$1 billion was established that would allow for the acquisition of twenty-three Lockheed *CP-140 Aurora* aircraft (the Canadian version of the *P-3 Orion*) or sixteen *Boeing 707* LRPA. A contract was finally signed in July 1976 for the procurement of only eighteen *Aurora* aircraft at a cost of \$1.061 billion. Despite arguments that more modern aircraft have a higher availability rate, there is a quality associated with quantity as well. The eighteen *Aurora* aircraft simply could not replace thirty-two *Argus* aircraft, let alone the fifty-eight maritime patrol aircraft operated by RCAF Maritime Air Command in 1962.¹³

¹⁰ Department of National Defence, *Defence 1974*, Ottawa: Information Canada, 1975, p. 67. RFP replies were received for the *Boeing 707*, Hawker Siddeley *HS801 Nimrod*, Lockheed *P-3C Orion* and the McDonnell Douglas *DC-10*.

¹¹ *Ibid.*

¹² See John Gellner, "How NOT to Buy an Airplane," *Canadian Aviation*, Vol. 49, No. 4, April 1976. The original estimate was for \$450 million. Ultimately, the *CP-140 Aurora* had a unit cost of \$59 million compared to \$19 million for the standard *P-3C Orion* procured for the RAAF. See also John Gellner, "We didn't need what we didn't get," *Canadian Aviation*, Vol. 49, No. 7, July 1976.

¹³ See also M. Walker, "A Partner for Aurora: Developing the Airborne Corvette," *Canadian Defence Quarterly*, Vol. 6, No. 4, Spring 1977.

The replacement of the existing fighter force had been an ongoing issue since the mid 1960s. In the early 1970s, there had been speculation that the *CF-101* and *CF-104* fighters would finally be replaced by the McDonnell Douglas *F-4E Phantom*, but lack of funds, the absence of political will, and the over-riding priority of USAF needs for *F-4* production for the war in South-East Asia were all factors that precluded replacement at that time.¹⁴ Finally, the Canadian government announced the New Fighter Aircraft (NFA) programme in March 1977 that was designed to replace the *CF-101*, *CF-104* and *CF-5* fighter aircraft.¹⁵ The Canadian Forces had procured a total of 419 of these three types, but under the NFA programme they would be replaced by a maximum of 150 new fighters within a budget limit of \$2.34 billion in 1977 dollars.¹⁶ Again, as with the LRPA programme, industrial offsets often trumped military requirements. Invitations went to six fighter aircraft manufacturers, and five responded.¹⁷ McDonnell Douglas proposed their *F-15 Eagle*, the most expensive aircraft and the one preferred by Air Command.¹⁸ However, the NFA budget would have limited the acquisition of the *F-15* to only ninety-seven aircraft, an extreme shortfall to meet Air Force commitments. Another option suggested a two-aircraft purchase with the Grumman *F-14 Tomcat* for North American air defence, and the General Dynamics *F-16* for NATO tasks. This would have meant two separate logistics and training systems and perpetuated the problems of earlier procurements of specialized aircraft such as the *CF-101* and *CF-104* that could not be adapted to other roles. In

¹⁴ Gordon A.A. Wilson, *NORAD and the Soviet Nuclear Threat: Canada's Secret Electronic Air War*, Dundurn: Toronto, 2011, p. 167.

¹⁵ Department of National Defence, *Defence 1979*, Ottawa: Information Canada, 1980, p. 98. By this time, the number of operational aircraft consisted of fifty-four *CF-104*, thirty-six *CF-101* and twenty-four *CF-5* fighters for a total of 114 aircraft, not including those required for training, testing, maintenance spares or attrition.

¹⁶ John Gellner, "The Fight for the Fighter," *Canadian Aviation*, Vol. 50, No. 12, December 1977.

¹⁷ "Six fighters in competition to replace CF-101s, CF-104s," *Canadian Aviation*, Vol. 50, No. 5, May 1977.

¹⁸ See W.K. Carr, "The New Fighter Aircraft: Operational Requirements and Desirable Characteristics," *Canadian Defence Quarterly*, Vol. 5, No. 4, Spring 1976, and Hugh Whittington, "Interview - Lieut.-Gen. William K. Carr discusses new fighters, the air reserves, search and rescue and the Canadian Forces Air Command today," *Canadian Aviation*, Vol. 50, No. 1, January 1977, pp. 7-8.

addition, the *F-14* was expensive, like the *F-15*. The acquisition of the *F-16* alone raised the difficulty that a single engine aircraft was not considered suitable for North American defence. However, the *F-16* allowed for the acquisition of 147 aircraft within the NFA budget, the largest number among all the types considered. Another advantage was its interoperability with other NATO nations that had adopted the *F-16*.¹⁹

The McDonnell Douglas *F-18A* was a naval development of the *YF-17*, a competitor for the US Air Force lightweight fighter competition, and itself a development of the Northrop *P.530 Cobra*, a candidate for the CAMRA in the 1960s.²⁰ The *F-18* had the advantage of twin-engines for use in the Far North, but in Europe it would be an “orphan aircraft.” There was also the Northrop *F-18L* that was a cheaper land-based version of the *F-18A*, with the same technical antecedents. The European option was the Panavia *Tornado*, the result of the NATO tri-nation consortium that had developed the Multi-Role Combat Aircraft (MRCA), the programme from which Canada had withdrawn in 1968.²¹ The *Tornado* was also an expensive aircraft, with twin engines, that would have been suitable for the North American interceptor and European interdiction roles, but it was not really suitable for the close air support role. The sixth possible candidate, the Dassault *Mirage 4000*, did not elicit a response from the manufacturer.

In the end the competition came down to a choice of 138 *CF-18* or 147 *CF-16* aircraft with the industrial offset benefits being a key factor in selection. However, the military advantage of twin-engines and a greater growth potential for the *CF-18* that promised well for

¹⁹ Bill Gunston, “F-104G to F-16: A Tale of Aircraft Procurement,” *RUSI Journal*, Vol. 120, No. 3, 1975.

²⁰ DHH 73/1223, Series 1, File 219, Equipment RCAF – Tactical Aircraft, S 1151-4110 TD. 7157, 6 June 1967, Canadian Advanced Multi-Role Aircraft (CAMRA) – NORTHROP P.530 Proposal. See also Bill Gunston, *F/A-18 Hornet*, Shepperton: Ian Allan Ltd, 1985.

²¹ Bill Gunston, *Panavia Tornado*, Shepperton: Ian Allan Ltd, 1980.

flexibility were certainly important factors in its final selection.²² The government selected the *CF-18* aircraft as the winner in the NFA competition in late 1978, but no contract was signed prior to the Liberal government defeat in 1979. The minority Progressive Conservative government declined to sign a contract, so that the NFA contract was not signed until the election of a majority Liberal government in 1980, a delay of two years. The selection of the *CF-18* represented a good decision by the Air Force and the government, as the Air Force finally acquired the multi-role aircraft that it had been seeking since the early 1960s.²³ Despite some trepidation about operating an “orphan” naval fighter as the first Air Force to select the *F-18*, the aircraft was eventually adopted by six other air forces. A negative aspect of the NFA programme, however, was the failure to take up the option of twenty additional *CF-18* aircraft to offset attrition losses. The air force’s continuing “commitment-capability gap” demonstrated that 138 *CF-18* aircraft could not replace the hundreds of fighters previously operated.²⁴

A fundamental organizational change in 1975 was the establishment of Air Command, a move that re-established a “de facto” air force within the unified Armed Forces. Within the new Air Command, functional groups re-created the pre-unification Air Force structure: Air Defence Group, Air Transport Group, Maritime Air Group, and No. 10 Tactical Air Group.²⁵ The exception was No. 1 Canadian Air Group that remained assigned to Canadian Forces Europe.²⁶ However, this “back to the future” approach brought mixed views. From Stephen James’

²² See John Gellner, “Let’s get on with the job,” *Canadian Aviation*, Vol. 52, No. 2, February 1979, and Hugh Whittington, “F-16 Got Benefit of All Doubt but Still Couldn’t Match F-18A,” *Canadian Aviation*, Vol. 53, No. 7, July 1980.

²³ See P.D. Manson, “The CF-18 Hornet – Canada’s New Fighter Aircraft,” *Canadian Defence Quarterly*, Vol. 10, No. 1, Summer 1980.

²⁴ Eight small operational squadrons were established, along with the Operational Training Unit, reflecting the NORAD and NATO commitments. However, without attrition aircraft, this force structure could not have been maintained.

²⁵ Air Reserve Group and No. 14 Training Group were additional formations added later, reinforcing the return to the RCAF “traditional” command structure.

²⁶ There were obviously still numerous linkages between Air Command and No. 1 CAG.

perspective, the creation of Air Command ensured the survival of the “air force” as a separate organization within the Canadian Armed Forces.²⁷ Ken Pennie, later the Commander of Air Command, wrote that the creation of Air Command resolved the post-unification problem by recognizing the basic tenet of air power, that is centralized command and control, a principle that had been entrenched in the RCAF both in an institutional and operational context.²⁸

In contrast, John Gellner, viewed the set up of Air Command as a retrograde development impinging on the promotion of the unified force for what today would be referred to as joint operations.²⁹ Sean Maloney adopts an extreme view, suggesting conspiratorial action on the part of what he referred to as the “virtual air force” that destroyed the original concept of both Mobile Command and unification.³⁰ Though there was now a theoretical centralized command and control of Canadian air power, in reality, the years of diffuse air power as a result of the 1965 integrated/unified command structure, along with the unification process itself, had taken its toll. Air Command was a fractured institution as the air components of Mobile and Maritime Commands remained under their operational control. These factors hindered resurgence of the Air Force, and the concept of independent air power. The resulting confusion was readily apparent at the 1984 Air Force Doctrine Symposium where the disparate air force functional communities each demonstrated its own interpretation of air force doctrine.³¹ Stephen James

²⁷ Stephen L. James, *The Formation of Air Command: A Struggle for Survival*, Unpublished MA Thesis, Kingston: Royal Military College of Canada, 1989.

²⁸ See K.R. Pennie, “The Impact of Unification on the Air Force,” in William A. March and Robert H. Thompson, (eds.), *Papers Presented at the 1st Air Force Historical Conference*, 18-19 November 1994, Winnipeg: Air Command Headquarters, 1994, p. 106.

²⁹ John Gellner, “Air Command,” *Canadian Aviation*, Vol. 48, No. 4, April 1975. See also “Editorial – What will Air Command command?” *Canadian Aviation*, Vol. 48, No. 4, April 1975.

³⁰ See Sean M. Maloney, ““Global Mobile II” The Development of Forces Mobile Command, 1965-1972,” *The Army Doctrine and Training Bulletin*, Vol. 4, No. 2, Summer 2001, pp. 20-21.

³¹ Department of National Defence. *Air Force Doctrine Symposium: Summary of Proceedings*, CFB Trenton, 24 January 1984. See also *Aerospace Doctrine Study – Final Report*, Ottawa: Department of National Defence, 30 April 2002.

decried “a federated air force absent of a unifying purpose.”³² By contrast the Air Force of the 1950s was a force that been created for “strategic effect.”³³ These were not the circumstances with the re-created Air Force of the 1970s that instead represented a case of survival mode.

The Air Force had successfully made the case for both the LRPA and the NFA programmes, but there was considerable opposition to Air Force re-equipment.³⁴ First and foremost, there was no longer a Canadian prime contractor for these programmes, so the focus was on offsets for Canadian industry, a practice that over-rode military requirements in the government’s approach to defence procurement.

The LRPA and NFA programmes began to produce results in the early 1980s, when a renewed chill in the Cold War justified the decisions to modernize the Air Force. Several reports produced by the Special Committee of the Senate on National Defence highlighted the shortfalls in Canadian air power. In its January 1985 Report, the committee recommended the North American air defence modernization, including the acquisition of twenty attrition *CF-18* aircraft,

³² Stephen L. James, “The Air Force’s Cold War Struggle with its National Purpose,” *Proceedings 3rd Annual Air Force Historical Conference*, Royal Military College of Canada, Kingston, Ontario, 1997, Winnipeg: Office of Air Force Heritage and History, 1997. See also Pennie, p. 109.

³³ See Paul Dickson, “Harry Crerar and an Army for Strategic Effect,” *Canadian Military History*, Vol. 17, No. 1, Winter 2008. See also Stuart Peach, “It’s the Effect That Counts – The Strategic Effect of Air Power,” in Peter W. Gray (ed.), *British Air Power*, Defence Studies (Royal Air Force) Joint Doctrine and Concepts Centre, Shrivenham, London: The Stationery Office, 2003. Another factor that acted against a strategic Air Force perspective was the result of what has been the “culture of the cockpit,” that over emphasized flying duties and flying related appointments. See Michael Hood, “Why Canadian Airmen are not Commanding,” *Canadian Military Journal*, Vol. 11, No. 3, Summer, 2011. Hood attributes this term to Lieutenant-General Angus Watt, Chief of the Air Staff, 2007-1009. See Scot Robertson, “What Direction: The Future of Canadian Aerospace Power and the Canadian Air Force,” *Canadian Military Journal*, Vol. 8, No. 4, Winter 2007-2008.

³⁴ In the case of the LRPA, there was some opposition to the procurement of a brand-new sophisticated aircraft such as the *Aurora*. Alternative (and cheaper) solutions suggested a re-build of the Argus and/or the acquisition of smaller cheaper coastal patrol aircraft such as the De Havilland Canada Dash 7 *Ranger*. There was much more widespread opposition to the New Fighter Aircraft programme ostensibly as the fighters represented “war planes.” See John Gellner, “What’s a Billion Dollars?” *Executive*, October 1976, Wayne Ralph, “The New Air Farce,” *Quest*, September 1978. Ralph challenged the NFA programme with its disconnect between the multi-billion dollar procurement of new jet fighters and the absence of a military strategy. See also Ernie Regehr, “For Canada’s Generals, now there’s...’Dinner with Wine,’ ” *Last Post*, Vol. 6, No. 2, April 1977. The title of this article originated with the comment by Lieutenant-General William Carr, the Commander of Air Command, that “an air force without fighters is like a dinner without wine....” In addition, the air force “attitude” over the years had not won over friends from the other services (Pennie, p. 106).

but without result.³⁵ The following year, the Special Committee issued its report on “Military Air Transport” that examined the airlift and air mobility situation in Air Transport Group and No. 10 Tactical Air Group.³⁶ Among the short-term recommendations of this report were the acquisition of one additional *CC-137* jet transport, and an increase in the *Hercules* fleet from twenty-six to thirty-three aircraft by 1988.³⁷ In the case of No. 10 Tactical Air Group, the committee noted the shortage of both *Twin Huey* and *Chinook* helicopters to support the Army. To rectify the short-term problem, three additional *Chinook* helicopters were needed to bring the fleet up to ten aircraft.³⁸ In the longer term to the 1990s, there was a requirement to acquire sixty LOH to replace the *Kiowa* and thirty-five UTTH to replace the *Twin Huey*.³⁹

By the time that the Mulroney Progressive Conservative government issued its June 1987 Defence White Paper, geostrategic events were unfolding so rapidly that the document was out-of-date by April 1989.⁴⁰ In terms of the Air Force, the Defence White Paper did not promise much. A major organizational change was the re-establishment of No. 1 Air Division in Europe as a result of consolidation of the two separate NATO fighter aircraft commitments - two squadrons allocated to the NATO Northern Flank and the three squadrons assigned to the Central Region AAFCE/4th ATAF. Apart from re-establishing the Air Division Headquarters in Germany, the peacetime stationing of fighter aircraft remained limited to the three squadrons

³⁵ Senate of Canada. *Report of the Special Committee of the Senate on National Defence – Canada’s Territorial Air Defence*, Ottawa, January 1985.

³⁶ Senate of Canada. *Report of the Special Committee of the Senate on National Defence – Military Air Transport*, Ottawa, February 1986. The Report recommended that ATG get out of the “airliner” business, and consolidate the aircraft fleet based on forty-five *Hercules* and twenty *Dash 8* aircraft.

³⁷ *Ibid.* p. 28.

³⁸ *Ibid.* p. 56.

³⁹ *Ibid.*

⁴⁰ Department of National Defence. *Challenge and Commitment: A Defence Policy for Canada*, Ottawa: Supply and Services Canada, 1987. See J.G.H. Halstead, “A Defence Policy for Canada: the White Paper Two Years On,” *Behind the Headlines*, Vol. 47, No. 2, Toronto: Canadian Institute of International Affairs, Winter 1989-90, especially p. 13 on air force reductions (i.e.) retirement of *Tracker* aircraft, acquisition of only three *Arcturus* vice six *Aurora* patrol aircraft, and no procurement of *CF-18* attrition aircraft.

now re-organized into No. 4 Wing at Baden-Soellingen. In the event of an emergency or war, No. 3 Wing with its two squadrons would be deployed to Lahr, West Germany. However, unlike the “glory days” for the Air Division during the 1950s, even with the deployment of the two wings in Germany, only seventy-eight *CF-18* fighter aircraft would be available compared to the Big Air Force period of twelve *Sabre* squadrons with 300 jet fighters. However, the White Paper did promise to correct long outstanding deficiencies by undertaking improvements for airfield defence and logistics support for the Air Division.⁴¹

The other major promise for the Air Force in the 1987 White Paper was the acquisition of six additional *Aurora* Long-Range Patrol Aircraft, a recognition that too few aircraft had been procured under the original programme.⁴² A proposal to upgrade the *Tracker* coastal patrol aircraft with turboprop engines in lieu of the piston engines did not come to fruition and the aircraft was withdrawn from service in 1990. There was no expansion or modernization of other elements of the Air Force prior to the end of the Cold War – air transport and tactical aviation remained essentially the same since the early 1970s.⁴³ The fall of the Berlin Wall in November 1989, culminating with the dissolution of the Soviet Union on 26 December 1991, marked the end of the Air Force involvement in the Cold War, the longest campaign in its history.

⁴¹ The government invested in the \$800 million Low Level Air Defence project consisting of anti-aircraft guns, surface-to-air missiles and radar systems. See W.H. Welsh, “The Canadian Forces and Airfield Defence,” *Canadian Defence Quarterly*, Vol. 9, No. 4, Spring 1980, and Michael Slack and Martin Shadwick, “Low Level Air Defence: The Canadian Dimension,” *Canadian Defence Quarterly*, Vol. 14, No. 1, Summer 1984. To correct logistics deficiencies, the White Paper announced the Allied Command Europe Logistics and Medical Support (ALMS) project designed not only to improve the provision of logistics support, but also to ensure its survivability through the dispersal of logistics installations and lines of communication. The author was involved in the ALMS project during Defence White Paper implementation 1987-89.

⁴² In the end, only three *CP-140A Arcturus* aircraft were obtained (essentially the *Aurora* without the ASW equipment).

⁴³ See George E.C. Macdonald, “The Air Force Programme: Implementing the White Paper,” *Canadian Defence Quarterly*, Vol. 17, No. 4, Spring 1988. Macdonald noted the intent to build up to a fleet of forty-five *Hercules* aircraft by 2000 and the build up of the Air Reserve from 950 to 8,000 personnel. Neither of these objectives was attained.

Conclusion

Throughout the last quarter century of the Cold War, the government and the Air Force failed to achieve a balanced priority among the competing three pillars of politics and economics, strategy and technology for the development of the Big Air Force that existed in the early 1960s. Ultimately, it was the political and associated fiscal dimension that was the deciding factor that overrode the strategic and technological issues.

From 1948 to 1957, the RCAF had successfully grown into the leading Tier 1 air force amongst the middle powers. Along with the build up of the RCAF, there had been the equally successful expansion of the Canadian aviation industry that was integral to the Big Air Force concept. Senior leadership at all levels – government, the RCAF and industry – had effectively put Possony’s “elements of air power” into practice. During the 1950s, “airmindedness” amongst the political leadership was a driving force that enabled both the RCAF and the aircraft industry to succeed. The RCAF leadership, however, failed to appreciate the extent to which changing technology (especially the rise of nuclear weapons), evolving international relations, and new fiscal agendas in domestic politics eroded airmindedness. Thus the RCAF was not well-positioned to meet future challenges such as the re-rolling and re-equipment of No. 1 Air Division, the changing demands of North American air defence or the new requirements of peacekeeping and mobile expeditionary forces. Eliot Cohen and John Gooch explained the need to appreciate the factors of learning, anticipation, and adaptation in order to understand why military organizations fail.⁴⁴

⁴⁴ Eliot A. Cohen and John Gooch, *Military Misfortunes: The Anatomy of Failure in War*, New York: Vintage Books, 1991, pp. 233-243.

In the case of the RCAF, it was a young service that had gained independence from the Army only in 1938 and thereafter experienced almost continuous expansion during the Second World War and then in the early Cold War. Under these circumstances, there was no previous model that could have been utilized as a guide for future air force development. The RCAF could have been more pro-active in studying possible future developments, but, equipment rather than policy tended to define service roles, the prime example being the manner in which the service placed “all its eggs into a single basket” with the Avro *Arrow* programme.⁴⁵ Understandably, the failure to adapt has been viewed as a failure of command.⁴⁶ This failure led to a RCAF that was hard pressed to defend its requirements against other more compelling new defence and non-defence needs. In their study, *Why Air Forces Fail: The Anatomy of Defeat*, authors Robin Higham and Stephen Harris postulate, “Service doctrine that is not in harmony with government policy is likely to produce circumstances in which air forces will fail; government policy made in isolation of service capabilities tends to do the same.”⁴⁷ In the case of the RCAF during the Cold War, this is the situation that developed by the end of the St. Laurent government. During its expansion after the February 1951 defence announcement, the RCAF and the government had a synchronized policy that enabled the RCAF to emerge as the dominant service in Canada seemingly representative of this Golden Age. The Big Air Force enabled the government to make a critical and credible contribution to Western defence for a short period time, reflecting a continuation of the earlier approach of “limited liability” based on air power and industry by previous Liberal governments. Compelled by alliance expectations to make Canadian Army contributions to the UN forces in Korea and to the Integrated Force in

⁴⁵ Colin S. Gray, *Canadian Defence Priorities: A Question of Relevance*, Toronto: Clarke, Irwin & Company, Limited, 1972. Gray has referred to this concept as “defence policy equals equipment plus organization,” p. 27.

⁴⁶ Cohen and Gooch, p. 239.

⁴⁷ Robin Higham and Stephen J. Harris (editors). *Why Air Forces Fail: The Anatomy of Defeat*, Lexington: The University Press of Kentucky, 2006, p. 348.

NATO, the Big Air Force concept provided the government with a viable alternative when discussion arose regarding increased army contributions to NATO or the UN, with the attendant spectre of conscription.

National capabilities that made possible RCAF expansion during the St. Laurent years included a well-developed industrial and educational infrastructure that enabled the necessary equipment and personnel, the required logistics support, political endorsement, and technological development.⁴⁸ These vital assets, however, were of limited value in the absence of coherent strategic vision.⁴⁹ For political and economic reasons, the Big Air Force concept could not be continued on an indefinite basis. Simply put, Canada could not afford the Big Air Force as envisioned by the RCAF leadership. The RCAF was cut down in size by the Liberal government under Lester Pearson. During the Trudeau and Mulroney years, despite modernization during the 1980s, it was the “minimalist air force” rather than the Big Air Force concept that prevailed.⁵⁰

The demise of the Big Air Force was evident both in the quantity and quality of its aircraft holdings. From a peak of 2,968 aircraft in 1956, the RCAF had declined to 1,300 aircraft by 1963.⁵¹ Further decreases resulted in holdings of 1,080 aircraft by 1973, and by the end of the Cold War, these numbers had further decreased to 692 aircraft representing nineteen different

⁴⁸ Higham and Harris, pp. 7-10.

⁴⁹ Paul Dickson, *Strategic Visioning in Canada's Air Force*, DRDC CORA TR 2007-01, Ottawa: Defence R&D Canada, Centre for Operational Research and Analysis, January 2007. See Scot Robertson, “What Direction? The Future of Aerospace Power and the Canadian Air Force – Part 1, *Canadian Military Journal*, Vol. 8, No. 4, Winter 2007-2008, and Scot Robertson, “What Direction? The Future of Aerospace Power and the Canadian Air Force – Part 2, *Canadian Military Journal*, Vol. 9, No. 1, Spring 2008. See also Perry M. Smith et al, *Creating Strategic Vision: Long Range Planning for National Security*, Washington: National Defense University Press, 1987.

⁵⁰ See Sean M. Maloney, “Better Late Than Never: Defence during the Mulroney Years,” in Raymond B. Blake (ed.) *Transforming the Nation: Canada and Brian Mulroney*, Montreal & Kingston: McGill-Queen's University Press, 2007. Maloney notes “...Canada would continue to adhere publicly to the long-standing Cold War structures like NATO, ...NORAD, and the United Nations, but this would be done with a minimalism...”(pp. 134-135).

⁵¹ William Green and Dennis Punnett, *Macdonald World Air Power Guide*, London: Macdonald & Co. (Publishers), Ltd. 1963, p. 6.

types, including 285 older jet trainers.⁵² In terms of quality, the Big Air Force in the 1950s had been equipped with top-of-the-line fighters such as the *Sabre* and the *CF-100*. Their replacements in the 1960s, the *CF-104* and the *CF-101* were primarily selected on political and fiscal grounds rather than as the best available equipment for the RCAF. The dubious acquisition of the *CF-5* represented a clear case of the danger associated with political interference in RCAF aircraft procurement. In the 1980s, the acquisition of the *CF-18* and the *CP-140 Aurora* provided the air force with advanced modern equipment. However, the procurement of 138 *CF-18s* to replace 419 *CF-101*, *CF-104* and *CF-5* aircraft, and eighteen *CP-140* to replace thirty-two *CP-107 Argus* aircraft in no way provided the same degree of capability. Despite the acquisition of these more modern aircraft, a sufficient number of operational aircraft to offset attrition losses and aircraft undergoing maintenance has a quality of its own.

As early as 1952 the chiefs of staff of the armed forces acknowledged that the RCAF re-armament programme was not sustainable, and this became more apparent as the decade progressed.⁵³ For most Canadians – politicians, military officers, aircraft industry workers, and the general public – the unaffordability of the Big Air Force reached home with the cancellation of the Avro *CF-105 Arrow* programme in 1958-59. If the project had adhered to its original parameters of solely developing the airframe, and utilizing off-the-shelf items for the other systems, then, it is conceivably possible that the aircraft would have been economically feasible. The continuing success of the RSAF and the Swedish aircraft industry in producing indigenous fighter aircraft demonstrated this possibility. However, there were also many aircraft

⁵² See “World Air Forces,” *Flight International*, No. 4397, Vol. 144, 24-30 November 1993, p. 47. These jet trainers included eighty-one *CF-5*, 114 *CT-114 Tutor* and sixty *CT-133 Silver Star* aircraft, many of them in storage.

⁵³ DHH 73/1223, Series 3, File 1307A, Chiefs of Staff Committee, Minutes of a Special Meeting, 15 January 1952.

development failures in such disparate nations as Switzerland, Italy, India, Egypt and Argentina.⁵⁴ This would suggest that airmindedness required more than a willingness to expend funds from the national treasury on what might be referred to as national “signature projects.” In his study of the *BOMARC* missile programme, Robert Clark noted:

Much of the success realized by the RCAF in their struggle with the Canadian Army in advocating their weapons programs is attributable to the structure of the Chiefs of Staff Committee. Senior RCAF officers became adept at using the Committee system to stonewall undesirable rival programs. Throughout the 1950s the RCAF developed into the most assertive and self-confident service in the Canadian Forces.⁵⁵

The perpetuation of *Avro Arrow* mythology continues to direct public animosity towards the Progressive Conservative government of John Diefenbaker. Though the Diefenbaker government committed numerous mistakes in the management of defence policy, and particularly in the case of the RCAF, the government made the correct decision to cancel the *Avro Arrow* programme. What is often forgotten is that this decision was based on the recommendation of the Air Staff and the Chiefs of Staff Committee. The cancellation of the *Avro Arrow*, though it caused serious damage to the Big Air Force concept, did not result in its demise at that time. Despite the change in the focus of air defence from “defending the nation” to that of “defending the deterrent,” the RCAF still realized its need to replace the *CF-100* interceptor for Air Defence Command. Commenting on the *Avro Arrow* affair, James Eays wrote that, “the cancellation of this project seven years later, after the aircraft had reached the

⁵⁴ Robert Jackson, *Cold War Combat Prototypes*.

⁵⁵ Clark, pp. 24-25.

prototype stage of development... dealt to the prestige and morale of the Air Force a blow from which it never fully recovered. Pride led to *hubris, hubris* to the CF-105.”⁵⁶

If “pride” and “hubris” led to the downfall of the Avro *CF-105 Arrow* programme, then the same could be applied to the adoption of the nuclear strike role and the selection of the *CF-104 Starfighter*. By 1958-59 when the strike role was under consideration by the RCAF, there was already significant evidence for the need to build up NATO conventional air forces and this was readily apparent by the time the Air Division had re-equipped in 1963.⁵⁷ However, the adoption of the strike role meant the retention of an “independent” role for the RCAF; the service would not be relegated to supporting the Army.⁵⁸ Its significant participation in the strike role enabled the RCAF to participate in the “big leagues” of operational planning and targeting in NATO circles. At one point, the RCAF provided 20 per cent of the 4ATAF day and night nuclear strike force.⁵⁹

Though the *CF-104* was designated as a “fighter,” in the strike role the aircraft was developed as a tactical bomber. The RCAF Ultimate War Plan of the early 1950s had envisaged the development of a bombing capability in the event of general war, then envisaged as a largely conventional and prolonged conflict that would allow time for the kind of mobilization that had taken place in the Second World War.⁶⁰ However, the RCAF had then ruled out the bomber role after the failed attempt during the “Closing the Gap” deliberations in the lead up to the 1952

⁵⁶ James Eayrs, *In Defence of Canada, Volume 3 – Peacemaking and Deterrence*, Toronto: University of Toronto Press, 1972, p. 123.

⁵⁷ John Gellner, “Canada in NATO and NORAD,” *Air University Review*, Vol. XVIII, No. 3, March-April 1967, pp. 25, 28-29.

⁵⁸ Raymond Stouffer, “Nuclear Virgin or Nuclear Strike? John Diefenbaker and the Selection of the CF-104 Starfighter,” in W.A. March, ed., *Sic Atur Ad Astra, Canadian Aerospace Power Studies – Volume 3: Combat if Necessary, but Not Necessarily Combat*, Department of National Defence: Canadian Forces Aerospace Warfare Centre, Trenton, Ontario, 2011.

⁵⁹ Clearwater, pp. 110-111.

⁶⁰ DHH 73/1223, Series 3, Subseries 13, Minutes of the 155th Meeting of the Air Members, 21 May 1952, pp. 2-3.

Lisbon Conference for the creation of a second RCAF air division equipped with light bombers.⁶¹ Instead, the RCAF had emphasized the build up of an effective corps of air defence jet fighters both in Canada and Europe, until the nuclear interdiction mission opened a fresh opportunity.

Despite characterization of the strike role as defensive, a commentator in the open press noted a report that “the Defence Department has been somewhat astonished at the fact that so far there has been no criticism of the change in the 14-year old role of the RCAF as an instrument of strictly defensive character.”⁶² The CAS, Air Marshal Dunlap, described the RCAF as a deterrent force in his testimony to the Parliamentary Special Committee on Defence in 1963.⁶³

Although RCAF officers might regard nuclear warheads as just another weapon in the arsenal, it was much more difficult for Canadian political leaders to do so. The decision by Lester Pearson in 1963 that Canada would honour its commitments to arm its nuclear weapons systems included the caveat for re-negotiation to extricate the country from these commitments as soon as possible. The adoption of the *CF-104* and the strike role provided life-support for the Big Air Force concept with the large procurement of 238 aircraft. It was only a respite, however, for the new Liberal government soon ruled that there should be no follow-on *CF-104* order and the force structure could not be sustained.⁶⁴ Nevertheless, the *CF-104* programme ultimately

⁶¹ The two Auxiliary light bomber squadrons equipped with the obsolete *Mitchell* until 1958 could not really be considered an effective bomber capability by any stretch of the imagination.

⁶² “Role of the CF-104,” *Aircraft*, Vol. 22, No. 1, January 1960.

⁶³ Air Marshal C.R. Dunlap Testimony, Special Committee on Defence, 31 October 1963.

⁶⁴ Among the RCAF’s supersonic fighters, the *CF-104* suffered from the highest accident rate, losing 110 out of 238 aircraft during its twenty-five years of service. In comparison, the *CF-101 Voodoo* accident loss rate was ten out of sixty-six aircraft over ten years.

cost the RCAF and the taxpayer in excess of one billion dollars representing the most expensive defence programme of that period.⁶⁵

The *CF-104* programme should be viewed as a failure on the part of the RCAF senior leadership for its inability to clearly enunciate to the government the strategic rationale for the strike role in terms of Canadian defence policy.⁶⁶ This failure was compounded by the fact that the *CF-104* was unsuitable for other roles.⁶⁷ Commenting on “the *Starfighter* affair,” Gellner noted

The hope is that the *CF-104* case may have taught our decision-makers a few valuable lessons. The three most important are: When buying a military aircraft, think of industrial benefits by all means, but do not put them before military considerations; do not expect an aircraft that was specifically designed to do job X, to do job Y efficiently, in other words, do not count on miracles; bear the need for standardization in mind, but not to the point of taking what others want us to have if it does not suit our own requirements.⁶⁸

The lack of another role for the *CF-104* gave credence to those critics who argued that Canadian defence policy had been based purely on its alliance membership.⁶⁹ The Liberal government’s attempt to continue existing alliance commitments while also introducing new roles and simultaneously trimming funding, contributed greatly to the increasingly Potemkin-village-like quality of the RCAF: the resources available were insufficient to sustain the alliance commitments let alone give substance to the new roles.

⁶⁵ Gellner, “Canada in NATO and NORAD,” p. 28.

⁶⁶ See M. Stephen Nemeth, *Canadian Postwar Aircraft Acquisitions: An Analysis of the Strategic, Economic and Political Factors*, Unpublished MA Thesis, Halifax: Dalhousie University, 1988, Chapter Six – The *CF-104 Starfighter* Acquisition – Procurement Before Policy. The *BOMARC* missile programme also constituted a failure with the short sighted view that surface-to-air missiles were supplanting manned interceptors for air defence rather than being complementary weapon systems. However, in this case, it “only” cost the Canadian taxpayer \$100 million.

⁶⁷ See John Gellner, “Military/Aerospace,” *Canadian Aviation*, Vol. 45, No. 3, March 1972. Gellner details the shortcomings of the *CF-104* in the conventional attack role.

⁶⁸ John Gellner, “The *Starfighter* Affair,” *Canadian Aviation*, Vol. 49, No. 12, December 1976.

⁶⁹ See McLin. Also see John W. Warnock, *Partner to Behemoth: The Military Policy of a Satellite Canada*, Toronto: New Press, 1970, and Lewis Hertzman et al, *Alliances and Illusions: Canada and the NATO-NORAD Question*, Edmonton: Mel Hurtig, 1969.

Rather paradoxically, in the wake of the failures associated with the Avro *CF-105 Arrow* and *CF-104* programmes, failure was also the end result of the highly lauded tactical fighter programme announced in the 1964 Defence White Paper. Partly from a determination not to accede to the demands of the air marshals for “nothing but the best” (the *F-4 Phantom*) but also recognizing that a less expensive close air support aircraft was more suitable for “brushfire wars,” Hellyer instead ordered 115 inexpensive *CF-5* aircraft that were unsuitable for the tactical fighter role.⁷⁰ The *CF-5* fiasco once again demonstrated that the RCAF had little interest in supporting the Army.

By contrast, the modernization and expansion of Air Transport Command, particularly the acquisition of a relatively large number of Lockheed *C-130 Hercules* transports, represented a positive development in Canadian air power. This provided the capability for rapid deployment of troops wherever the government decided they should be committed, including missions for the UN duties, and on the NATO flanks. There was also the embryonic development of tactical aviation designed to support the Army that reached the apex of its development and expansion in the next decade. In both instances, this was use of air power in a supporting role for the Army, not the “independent” application of air power as represented by strategic air defence or the strike-reconnaissance role.

By the mid 1960s, the air force was caught in an unresolvable conflict between two concepts of air power, “Douhet with nukes,” and Mitchell’s “anything that flies.” On the one hand, there was the institutional RCAF that had embraced the independent roles of the “nuclear

⁷⁰ In fairness to the *F-5*, a much-improved version, the *F-5E Tiger II*, was developed in the 1970s entering service with various air forces of which some upgraded versions still serve today. Unfortunately, the *F-5E* was too late for the Canadian tactical fighter programme. See Frederick A. Johnsen, *Northrop F-5/F-20/T-38*, North Branch, MN: Specialty Press Publishers and Wholesalers, 2006, pp. 62-91.

air force” with its *CF-104s*, *CF-101s* and *BOMARCs*. On the other hand, there was the actual development of a more balanced and flexible force designed to contend with the more likely forms of expected conflict. The Carpenter Report stressed “flexibility” in its proposed force structure. In reality, the RCAF had to contend with the inflexibility of operating specialized aircraft designed for single roles that could not be utilized for other purposes. With its insistence on the “nuclear air force,” the RCAF failed to provide flexible air power that would have provided the government with choices, hence the imposition of strong political direction in what should have been essentially military decisions. The Carpenter Report provided the RCAF with an alternative vision for the future that was completely ignored – at the air force’s peril.

The lack of a coherent strategy, economic folly, political legerdemain, and military parochialism were all factors that lead to the demise of the Big Air Force Concept. With Trudeau’s 3 April 1969 Defence Policy Statement, air power in the Canadian Forces was reduced to a hodge-podge collection of various types of aging military aircraft that now added a number of non-military tasks to their repertoire. This was a far cry from the 1951 pronouncement that “Canada will become the third ranking air power in the free world and probably the second ranking air training nation.”⁷¹

The expansion of the RCAF into one of the world’s leading air forces during the St. Laurent years represented a considerable achievement for a nation of 14 million people. A dynamic political and military leadership acknowledged the need to allocate the required resources to counter the perceived threat. The existence of a strong aviation industry ensured the development and production of aircraft to meet not only the operational needs of the RCAF, but also the requirements for the RCAF’s greatly expanded training system that supported NATO

⁷¹ *Globe and Mail*, 6 February 1951.

needs, and the provision of aircraft to Allied air forces. However, the RCAF's weaknesses in long range planning for force development plagued the service and contributed to its eventual decline and demise. Colin Gibson's vision of a balanced air force in 1946 that could support the Army in the field did not reflect what eventually emerged as the Canadian version of air power with the "nuclear air force" of the early 1960s. The development and implementation of the Big Air Force occurred at a unique time in the nation's history during the St. Laurent years: "In 1945, it had been expected that the central government's preoccupation would be social security and domestic improvement. Instead it was defence."⁷² A significant portion of this preoccupation on defence was the attention devoted to air power. By the late 1950s, the quest for improved social and economic development had re-emerged as the priority for both political leaders and the public, challenging the rationale for the Big Air Force concept. The existence of unique circumstances enabled the RCAF to develop the Big Air Force to become Canada's first line of defence and to represent the "Canadian way of war" during this vital period of the Cold War, circumstances that are not likely to be repeated.

⁷² Robert Bothwell, Ian Drummond and John English, *Canada Since 1945: Power, Politics and Provincialism*, Toronto: University of Toronto Press, 1981, p. 135.

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