

Proud to Serve:
An Operational History of Number 162 (Bomber Reconnaissance) Squadron,
Royal Canadian Air Force, 1942-1945

by

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The disbandment of No. 162 Sqdn. leaves a long career of 3 years of successful operation on the North Atlantic. To all the personnel it meant the end of one of the most colourful Squadrons in Coastal Command and one in which they have all been proud to serve.

162 (BR) Operations Record Book,
Summary for August 1945.

Abstract

This thesis examines part of an important but largely neglected area of Canadian history: the role of the Royal Canadian Air Force's (RCAF) Eastern Air Command (EAC) in the Battle of the Atlantic during the Second World War. An official history of these events was not published until 1986, which meant that few historians, either academic or popular, examined this aspect of Canadian aviation and military history in any depth. Eastern Air Command's obscurity was also a consequence of the postwar actions of the RCAF, which demonstrated that EAC and its squadrons were not considered worthy of perpetuation as postwar units. Among the units left by the wayside was Number 162 (Bomber Reconnaissance) Squadron, the most successful anti-submarine squadron in RCAF history. Operating from bases in Canada, Iceland, and Scotland, 162 (BR) sank five U-boats, shared in the destruction of a sixth, and damaged a seventh. The vast majority of these victories (four sinkings and one shared) took place in the waters north of the British Isles during June 1944, during which time one of the squadron's pilots was awarded a posthumous Victoria Cross, the Commonwealth's highest award for valour. Although 162 (BR) was not typical of Eastern Air Command squadrons, its history warrants attention, not only because it demonstrates what EAC squadrons could accomplish when given the opportunity but because it provides insight into the problems faced by EAC during the war, into inter-Allied relations in the Battle of the Atlantic, and into maritime air operations in general.

While the scale of the Battle of the Atlantic and the Second World War in general might suggest that the role of a single unit would be inconsequential, historians have recently asserted that unit histories provide an important bridge between broad general studies and personal reminiscences or "popular" unit histories as well as providing insights into both the overall strategy of the war and its everyday character. Unit history almost always requires a chronological approach in order to make sense of and to try to understand the war from the unit's perspective. The most reasonable examination of 162 (BR)'s

history follows this pattern, which places the squadron's creation and subsequent experiences in the context of the expanding forces of Eastern Air Command as well as in the context of the broader war in the North Atlantic.

Chapter 1 examines the origins of Eastern Air Command and the creation of 162 (BR) in Yarmouth, Nova Scotia in early 1942. The second and third chapters describe the early problems and shortages of aircraft and personnel experienced by the squadron. The move to Iceland is examined and explained in Chapter 4, while the squadron's early encounters with the enemy are detailed in Chapter 5. The high point of the squadron's career, the successes of June 1944, are examined in Chapter 6. The beginnings of the inshore U-boat campaign and its drastic effect on maritime air operations in the North Atlantic are covered in Chapter 7, and the history of 162 (BR) during the final months of the war, including its return to Canada and disbandment in August 1945 occupy Chapter 8.

This squadron has been neglected, but study reveals some of the problems faced by EAC in its attempts to create and maintain a modern anti-submarine force during the Second World War. The unit's accomplishments in June 1944 also demonstrate what could be accomplished by EAC squadrons when given the opportunity, while the drastic decline in sightings and attacks that began almost immediately afterwards reveal some of the effects of the inshore U-boat campaign on 162 (BR) and on Allied maritime air operations in general. Hopefully, this examination of Number 162 (Bomber Reconnaissance) Squadron will salvage an important episode in Canada's modern history that has long been ignored by historians.

Acknowledgements

This thesis would not have been possible without the encouragement and assistance of many people. My thanks go to all of them for their time and assistance. Dr. Marc Milner, my advisor, first suggested the topic, provided advice, and waded through the first draft of this thesis. The staff at the Directorate of History, Department of National Defence, Ottawa, provided invaluable help. Carl Christie, former Senior Historian, took the time from his busy schedule to answer questions. Dr. Roger Sarty provided advice, fielded questions, and helped with microfilm records, while Bill Rawling also helped with general questions. Former members of 162 (BR) Ray Crone and C.V. MacLachlan provided information and answered questions about the squadron. Aviation historian Hugh Halliday kindly provided a list of 162 (BR) casualties, as well as a list of medals and awards to the squadron's personnel from the comprehensive list he has been preparing.

In November 1995, crew #1 of Number 415 Squadron from Greenwood, Nova Scotia, gave me some idea of what is involved in maritime patrol operations when I joined them on a fisheries patrol. My thanks go to Captains Craddock, Cayley, Bloom, Boisvert, Beese, and Tuck, Lieutenant Bergeron, MWO Smith, W/O Connors, Kirby and Hamilton, Sergeant West, and DFO Observer Mr. J. McCarthy for an invaluable experience.

Above all I would like to thank my parents, who have provided support during the writing of this thesis and who put up with me while the final draft was being produced. They are probably as glad as I am to see it finished.

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Glossary

600 lb. Depth Charge	Codename for the Mark 24 Mine (q.v.).
A/A	Anti-Aircraft.
A/C	Aircraft.
Amphibian	Aircraft capable of taking off and landing from land or from water.
A/S	Anti-Submarine.
ASD	American-built 3cm airborne surface search radar. Also designated AN/APS-3.
ASV	Air-Surface Vessel. The generic British term for airborne surface search radar.
ASV Mk.II	British-designed 1.5m airborne surface search radar.
ASW	Anti-Submarine Warfare.
Bomber Reconnaissance (BR)	Canadian designation for maritime patrol squadrons.
Canso	RCAF version of the American-designed Consolidated PBY-5 flying boat (q.v.).
Canso "A"	RCAF version of the American-designed Consolidated PBY-5A amphibian (q.v.).
Catalina	American-designed of flying boat and amphibian, produced in a number of models by Consolidated Aircraft.
Coastal Command	The portion of the RAF operating land-based maritime patrol, anti-submarine, and anti-shipping aircraft during the Second World War.
EAC	Eastern Air Command.
Flak	Term for anti-aircraft artillery and its fire, originally German.
Flying Boat	An aircraft operating from water whose fuselage forms the hull that provides flotation.
General Reconnaissance (GR)	British designation for maritime patrol squadrons.
HEP	Harbour Entrance Patrol.
HWE	Home War Establishment. The portion of the RCAF based in Canada during the Second World War.

“High Tee”	RCAF codename for sonobuoys (q.v.) and their receiving equipment mounted in aircraft.
Mark 24 Mine	American-designed acoustic homing torpedo, carried by aircraft for use against submarines.
OAS	Outer Air Sweep. Air patrols for convoy protection carried out at a distance from the convoy.
O.C.	Officer Commanding. The officer in command of a military unit such as an airforce squadron.
Proctor	RCAF codename for the Mark 24 Mine (q.v.).
Project “Z”	RCAF codename for the Mark 24 Mine (q.v.).
RAF	Royal Air Force. The national air force of Great Britain.
RCAF	Royal Canadian Air Force.
RCN	Royal Canadian Navy.
RSB	Radio Sonobuoy. A wartime designation. See Sonobuoy.
Schnorkel	A breathing tube that allows submarines to operate their diesels while at a shallow depth.
Sonobuoy	A hydrophone (underwater microphone) coupled with a radio transmitter. Designed to transmit underwater noises to a listener in an aircraft.
UBAT	A form, used by Coastal Command (q.v.), to report and describe attacks made by aircraft on U-boats.
U/S	Unserviceable.
USAAC	United States Army Air Corps.
USAAF	United States Army Air Force.
USN	United States Navy.
VLR	Very Long Range.
WAC	Western Air Command, which controlled the HWE in Western Canada.
Yagi aerial	A directional radio aerial used in ASV Mk.II (q.v.) installations. Contemporary television aerials use the same design.

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Introduction

Sectabimur usque per ima
(We will hunt them even through the lowest deeps)
Motto of Number 162 (Bomber Reconnaissance) Squadron,
Royal Canadian Air Force

The National Aviation Museum in Ottawa preserves and displays important aircraft and aviation relics from Canada's past. Enconced in a modern building, its collection of aircraft includes civil and military types, dating back to the early years of heavier-than-air flight. Among them are a variety of aircraft from both the First and Second World Wars: basic training aircraft, fighters, and heavy bombers. All of them are meticulously restored and are on public display, surrounded by signs and photographs explaining their historical significance.

In the back of the building, roped off from the public and pushed aside amid a carefully arranged jumble of wings and fuselages, sit two large and unprepossessing aircraft. Neither one bears the gloss of other exhibits, and there are no signs explaining what they are or why they merit inclusion in the museum. One is a Canso, the other a Liberator. Both are representatives of types of aircraft flown by hundreds of Canadians during the Second World War on long and lonely patrols over the Atlantic Ocean, protecting Allied ships and hunting Axis submarines. Their place out of the limelight at the museum mirrors the status of their activities in Canadian aviation historiography.

However, those neglected Cansos and Liberators played a vital role in the Battle of the Atlantic, the longest campaign of the Second World War. Stretching from the first day of the war in Europe to the last, it was a fight in which the Allies strove to transport the materials of war to the British Isles and later to Europe in the face of Axis attack and the often vile weather of the North Atlantic. While popular conceptions of the Atlantic war typically pit Allied ships against Axis submarines and surface raiders, Allied aircraft sank half of the German submarines claimed by the Allies during the war. Equally importantly, they forced them under the surface of the ocean where they could not keep up with their

prey. In every way, aircraft played an essential role in securing the Atlantic for the Allies. Among the Allied air forces battling the submarine menace was the Royal Canadian Air Force, whose squadrons were an integral part of the Allied antisubmarine effort. Their story has been largely untold.

One of these little-known RCAF squadrons was Number 162 (Bomber Reconnaissance).¹ An unheralded maritime patrol squadron of Eastern Air Command (EAC), in operation from early 1942 until the end of the war, 162 (BR) operated from a variety of bases on Canada's East Coast as part of the RCAF's Home War Establishment (HWE), the organisation responsible for the aerial defence of Canada. With the exception of a few squadrons that saw service in the Aleutians, 162 (BR) was the only HWE squadron to "get overseas": it was posted to Iceland from January 1944 until the end of the war. There, in the Eastern Atlantic, it met with great success, sinking five U-boats, sharing in the destruction of a sixth, and damaging a seventh. No other RCAF squadron had a comparable record in the Atlantic war. One of its pilots, David Hornell, won the Victoria Cross, the Commonwealth's highest award for valour and one of only two awarded to RCAF personnel during the war.

Despite this successful record, 162 (BR) and the kind of operations it undertook have been almost totally neglected by historians. Their efforts have been eclipsed by Canada's overseas fighter and bomber operations, and even by other wartime aviation activities that took place within Canada itself. Much has been written, especially in the form of popular histories, about the exploits of the RCAF overseas. Fighter operations, with their aura of glamour and danger, have received a considerable amount of attention. Canada's role in the strategic bombing campaign against Germany has also been a subject

¹ "Bomber Reconnaissance" was a term unique to the RCAF. On 31 October 1939 seven of the RCAF's squadrons whose primary purpose was reconnaissance but which could be used for bombing duties were redesignated "Bomber Reconnaissance". These squadrons undertook maritime patrols in protection of shipping and against submarines. Samuel Kostenuk and John Griffin, RCAF Squadron Histories and Aircraft, 1924-1968, (Toronto: Samuel Stevens Hakkert & Company, 1977), 20.

of interest, because of the scale of the country's participation, because of its violent nature and because of the debate concerning its morality. The British Commonwealth Air Training Plan, which trained pilots and aircrew in Canada for the Allied war effort, has been the subject of several monographs.² Even Ferry Command, a largely Canadian based operation responsible for flying many thousands of combat aircraft from Canada and the United States to overseas areas of operations, has recently been the subject of a thorough and comprehensive history.³ In comparison with other aspects of Canadian wartime history, the activities of the Home War Establishment, those squadrons that flew against the enemy from bases here in Canada have received relatively little attention.

It is perhaps not surprising that the Home War Establishment has not received as much attention as the RCAF's other operations. The HWE's activities are generally not seen as having been as dangerous and exciting or even as important as those of the more publicised "400 series" fighter and bomber squadrons. The aircraft they used were often obsolescent and always less glamorous than high-performance fighters bristling with armament or bombers dropping tons of explosives over enemy territory, braving flak⁴ and enemy fighters in the process. Much of this perception is fairly accurate; most of the fighter squadrons in the RCAF's Home War establishment, for example, never saw action at all.⁵ There were elements of the HWE, however, that operated almost constantly against

² See, for example, F.J. Hatch, Aerodrome of Democracy: Canada and the British Commonwealth Air Training Plan, 1939-1945, (Ottawa: Department of National Defence, Directorate of History, Monograph Series No. 1, 1983); Ted Barris, Behind the Glory, (Toronto: Macmillan Canada, 1992); Peter C. Conrad, Training for Victory: the British Commonwealth Air Training Plan in the West, (Saskatoon: Western Producer Prairie Books, 1989).

³ Carl Christie, Ocean Bridge: The History of RAF Ferry Command. (Toronto: University of Toronto Press, 1995).

⁴ "Flak" is a term (originally German) used to describe anti-aircraft artillery and the munitions it fires.

⁵ With the exception of some squadrons on the West Coast which saw service in the Aleutians against the Japanese. See 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), 400-427. Other HWE fighter squadrons, such as 125 (F) and 127 (F), were sent overseas in early 1944 to serve in Europe. Kostenuk and Griffin, RCAF Squadrons and Aircraft, 59-60.

the enemy from the beginning of the war until its conclusion. They were the maritime patrol squadrons of the Royal Canadian Air Force. They flew from Canadian and Newfoundland airfields in search of U-boats and to escort vital merchant shipping. While Canadians went about their daily routines far removed from the war zones, RCAF airmen operating from Chatham, New Brunswick, Yarmouth, Nova Scotia, or Gander, Newfoundland, faced the hazards of vile weather and enemy gunfire in the waters of the western Atlantic. Operational flying in the western Atlantic was similar to that faced by squadrons operating on the other side of the Atlantic, and if the enemy was encountered less frequently, in the west than in the east, worse operating conditions compensated for it.⁶

Despite some impressive battles and confrontations, anti-submarine operations by aircraft were, and remain, among the least spectacular of military aviation's operations. During World War Two it was not unusual for maritime patrol crews to complete an entire tour of duty, many hundreds of hours of flying, without ever actually *seeing* an enemy submarine, much less *attacking* one. They did their jobs by being there. Furthermore, most of the aircraft used in anti-submarine operations were large, lumbering machines, often relegated to such duty because they were unfit for front line service.⁷ The scarcity of historical works on maritime air and anti-submarine operations during the Second World War can be blamed on these and other factors. It is not naval, except for aircraft carrier operations, so naval historians largely ignore it, and air enthusiasts largely shun it in favour of more "interesting" or "exciting" aspects of aerial operations. Maritime air power was nonetheless an important element of the Second World War, and it deserves more attention than historians have shown so far.

⁶ Volume II of the RCAF's official history describes EAC's operational area as having "some of the worst flying weather in the world." Douglas, The Creation of a National Air Force, 465.

⁷ The one real exception to this categorising of maritime patrol aircraft during the Second World War was the Consolidated B-24 Liberator, which saw service as a bomber with Allied air forces.

“Maritime air power” for the purposes of this thesis refers to land-based aircraft operating over the ocean, as opposed to “naval air power” which consists of aircraft operating from ships. Naval air power during the Second World War has received a considerable amount of attention from both academic and popular historians, largely because of the spectacular battles between American and Japanese carriers in the Pacific. There are also a number of good monographs on carrier operations in the Atlantic war, but they are written by naval historians and not by aviation historians.⁸

These studies, and many others, depend to a greater or lesser extent on the use of the official histories of the participating armed forces. Official historians have given some attention to maritime air power, but most of it has been focussed on the Coastal Command of Britain’s Royal Air Force.⁹ Coastal Command’s activities, especially actions such as the spectacular campaign against U-boats in the Bay of Biscay in 1943, and its sheer numerical importance in the Battle of the Atlantic, are undoubted reasons for garnering some attention. Its equally impressive operations against enemy shipping (the “Strike Wings”) have also drawn attention to themselves.¹⁰ The history of Coastal Command operations have also been well served for many years by British official history, both in Denis’ and Saunders’ *Royal Air Force, 1939-1945* (published between 1953 and 1954), and by Roskill’s history of the Royal Navy, *The War At Sea, 1939-1945* (published 1954-1961), both of which provide accounts of Coastal Command’s role in the war.¹¹ Both of these

⁸ For examples, see Kenneth Poolman, Escort Carrier, 1941-1945, (London: Ian Allan, 1972); William Y’Blood, Hunter-Killer, (Annapolis, Md: U.S. Naval Institute Press, 1983).

⁹ It should be pointed out that Commonwealth and other Allied squadrons served as part of Coastal Command while still retaining their national identities. For information on the Canadian squadrons which served as part of Coastal Command, see Brereton Greenhous, Stephen J. Harris, William C. Johnston, and William G.P Rawling, The Crucible of War, 1939-1945: The Official History of the Royal Canadian Air Force, Volume III (Toronto: University of Toronto Press, 1994), 375-474.

¹⁰ See, for example, Roy Conyers Nesbitt, The Strike Wings: Special Anti-Shipping Squadrons, 1942-1945 (London: Kimber, 1984).

¹¹ Denis Richards and Hilary Aidan St. George Saunders, Royal Air Force, 1939-1945 (London: HMSO, 1953-1954), 3 vols. Steven Wentworth Roskill, The War At Sea, 1939-1945

official histories are good basic sources for the historian of Coastal Command and its anti-submarine operations, but American maritime air operations against submarines have not been as well served. Their efforts were divided between the Antisubmarine Command of the United States Army Air Force (USAAF) and the United States Navy until 1943, after which even land-based maritime air operations became entirely a concern of the United States Navy.¹² The activities of the Antisubmarine Command are covered in Craven and Cate's *The Army Air Forces in World War II*, along with the debates that eventually resulted in control of anti-submarine aviation being passed to the United States Navy. A recent work, Max Schoenfeld's *Stalking the U-boat*, studies the history of the 479th and 480th Antisubmarine Groups in the Battle of the Atlantic, and is the first real historical study of the Antisubmarine Command since Craven and Cate.¹³

Since America's primary naval focus during the war was the Pacific, not the Atlantic, its official naval history reflects that interest. Samuel Eliot Morison's *History of United States Naval Operations in World War II*, a fifteen-volume work, has nine volumes dealing with Pacific operations, while only two dealing directly with the Battle of the

(London: HMSO, 1954-1961), 3 vols. The former work is hampered by its narrative bent and neither have bibliographies or references.

¹² As a general rule, prior to 1943 the USN was responsible for antisubmarine operations using flying boats and floatplanes, since they were operated from the water, while the USAAF's Antisubmarine Command was responsible for land-based A/S aircraft. This division of responsibilities also affected their supply of aircraft. At the beginning of 1942, for example, the USN received the entire production of seaplanes and flying boats, while the USAAF controlled virtually the entire production of land-based aircraft. Although land-based aircraft were to play an important role in the Battle of the Atlantic, the USAAF had never predicted that they would be responsible for this task. Great Britain, Air Ministry, Air Historical Branch, "The RAF in Maritime War, Volume III: The Atlantic and Home Waters - The Preparative Phase, July 1941 to February 1943," 72 DHist 79/599; Wesley Frank Craven and James Lea Cate, *The Army Air Forces in World War II, Volume One: Plans and Early Operations, January 1939 to August 1942*, (Chicago: University of Chicago Press, 1948), 519-526. The USAAF was created from the United States Army Air Corps and General Headquarters Air Force on 20 June 1941 in order to provide unity of command of the air arm. *ibid.*, 114-116.

¹³ Wesley Frank Craven and James Lea Cate, *The Army Air Forces in World War II* (Chicago: University of Chicago Press, 1948-1958), 7 vols; Max Schoenfeld, *Stalking the U-boat: USAAF Offensive Antisubmarine Operations in World War II*, (Washington: Smithsonian Institution Press, 1995).

Atlantic.¹⁴ This disparity provides some explanation for the paucity of sources on American maritime air operations in the Atlantic, especially from 1943 onwards, when anti-submarine aviation became the sole responsibility of the navy. Morison's coverage of maritime air operations is necessarily limited by space considerations, which results in a less than complete picture of American operations in this field, and his recording of the activities of the USN escort carriers in the mid-Atlantic only seems to push maritime air operations further into the background. Recently, however, some interesting work has emerged, including a history of lighter-than-air anti-submarine operations by the United States Navy.¹⁵ As with the British histories, little that is directly of value can be found for the historian of Canadian maritime air operations. However, British and American accounts do provide useful context and information on American operations from bases in Newfoundland and the division of areas of responsibility between American and Canadian operations in the Western Atlantic which is useful when discussing the relationship between the two countries, their maritime air policies, and the disposition of their forces.

Works concerning Canadian maritime air operations were until recently even more scarce than those describing British or American activities. Until very recently, no official history of the RCAF's activities during the Second World War existed. Without an official history to form a basis for research and writing, and to draw attention to the many lesser known areas of operations, historians and authors of popular works were often forced to rely either upon sources of dubious value or upon a limited selection of the many primary sources available to them. There had been great plans in 1945 for the creation of a multi-

¹⁴ There are also two volumes on operations in the Mediterranean, one volume on the D-Day invasion, and a one-volume supplement and general index. Samuel Eliot Morison, History of United States Naval Operations in World War II (Boston: Little, Brown and Co., 1947-1965), 15 vols.

¹⁵ There has been some recent work on American maritime air power during the war, both in the second volume of the RCAF's official history, and also about one of its more unusual aspects - the operation of anti-submarine blimps by the United States Navy. See J. Gordon Vaeth's Blimps & U-Boats: U.S. Navy Airships in the Battle of the Atlantic, (Annapolis: US Naval Institute Press, 1992).

volume official history of the RCAF, but these came to nought largely due to Brooke Claxton, Minister of Defence in the immediate postwar period, although the RCAF's senior officers may have contributed to its demise by giving little support to the project. It was not until 1980 that the first volume of the Royal Canadian Air Force's official history was published, and this volume dealt with Canadian aviators in the First World War!¹⁶

W.A.B. Douglas' *The Creation of a National Air Force*, published in 1986, was the second volume in the series. It deals with the air force between the wars, the British Commonwealth Air Training Plan, Ferry Command, and the operations of the Home War Establishment.¹⁷ This work provides a synthesis and analysis of the available primary sources, a discussion of policy and procurement of aircraft, and a coherent narrative of, among other subjects, the Home War Establishment's maritime air operations. It also provides useful information on the operations of 162 (BR) which is mainly limited to brief descriptions of the squadron's activities, especially its successes against U-boats in the summer of 1944.¹⁸ The third volume of the official history, *The Crucible of War*, (B. Greenhous *et. al.*, 1994), covers the RCAF's overseas operations during the war, including the activities of the Canadian squadrons attached to Coastal Command.¹⁹ These two volumes are important basic sources for researchers, but a history of a specific unit requires information from other sources as well.

¹⁶ 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). There is a brief discussion of the attempts to write an official history of the RCAF in the preface to this book. For a description of the plans and activities of the RCAF Historical Section during the Second World War, see Kenneth B. Conn's "The Royal Canadian Air Force Historical Section," Canadian Historical Review, 26:3 (September 1945), 246-254. C.P. Stacey, A Date With History: Memoirs of a Canadian Historian (Ottawa: Deneau, 1983), 196-197, provides a brief account of the demise of the RCAF official history and the partial demise of the Royal Canadian Navy's official history. For a discussion of the trials and tribulations of the various official histories in the postwar period, see W.A.B. Douglas, "Filling Gaps in the Military Past: Recent Developments in Canadian Official History," Journal of Canadian Studies, 19:3 (Fall 1984), 112-124.

¹⁷ W.A.B. Douglas, The Creation of a National Air Force.

¹⁸ *ibid.*, 592-596.

¹⁹ Greenhous *et. al.*, The Crucible of War. The sole exception to this coverage of overseas operations is 162 (BR), which, for organisational reasons, is covered in Volume II of the history.

Apart from official histories, there are few available sources on maritime air operations during the Second World War, and of these many remain either unpublished or have had a very limited distribution. Many of them are essentially primary documents. Among them are in-house histories of the USAAF's Antisubmarine Command, Eastern Air Command, and *The RAF and Maritime War*, a history of RAF maritime air operations.²⁰ Of the published monographs, Alfred Price's *Aircraft Versus Submarine* is perhaps the best known. Price describes air operations against submarines during both world wars and during the Cold War, as well as the operations of aircraft carriers in the antisubmarine role. Unfortunately, Price's book lacks adequate documentation, and some of his conclusions, especially on the effectiveness of certain weapons systems, are questionable.²¹ Most unfortunately for anyone studying Canadian maritime air operations, Price's emphasis is on British and American operations. This is undoubtedly due to their prominence in the Battle of the Atlantic, but it is probably also due to the lack of any real history of Canadian maritime air operations at the time he wrote this book. The two most prominent Canadian references in Price's work are the action in which F/L D.E. Hornell of 162 (BR) Squadron won his Victoria Cross and the unique example of F/O K.O. Moore, a Canadian flying with the RAF's 224 Squadron, who sank two U-boats in the space of twenty-two minutes. These are used not only because they were unusual occasions, but also because they are some of the few detailed examples of Canadian operations that could be found in the general literature prior to the publication of the RCAF's official history.²²

²⁰ W.D. McMaster, *The History of Eastern Air Command*, DHist 74/2; Great Britain, Air Ministry, Air Historical Branch, "The R.A.F. in Maritime War" DHist 79/599.

²¹ Alfred Price, *Aircraft Versus Submarine: The evolution of the anti-submarine aircraft, 1912 to 1980* (New York: Jane's, 1980). Price provides upbeat descriptions of the Mark XXIV Mine (an acoustic homing torpedo) and its successes against U-boats without providing figures on its effectiveness or its technical problems. Similarly, he grants airborne radar too much effectiveness as a method of detecting submarines.

²² These two events are both unusual, each for their own reasons, and definitely should not be marginalized. The Victoria Cross, the Empire's highest award for gallantry, was rarely awarded. Hornell received one of only two VCs awarded to RCAF personnel during the Second World War. Moore's exploit was singular; no other pilot made two confirmed U-boat sinkings on a single mission.

One such history of the RCAF, released before the official histories were published, is Leslie Roberts' *There Shall Be Wings: A History of the Royal Canadian Air Force* (1959).²³ Roberts provides a narrative overview of the development of military aviation in Canada. Unfortunately, he provides no documentation, and produces a generally upbeat narrative, providing information on victories and losses. Much of his emphasis on wartime operations is on the activities of the RCAF overseas, rather than on the Home War Establishment. As diversion or entertainment it provides a "good read"; as an historical source, it falls short of the goal. Part of the blame for Roberts' focus on the Royal Canadian Air Force's overseas operations during the Second World War must rest with the postwar RCAF. Its squadrons were (and still are) numbered in the 400 series, numbers borne by the squadrons which served with the RCAF overseas during the Second World War.²⁴ Even the modern maritime air squadrons bear numbers in the 400 series, despite some rather tenuous historical connections with their past activities. For example, Number 405 Squadron, which today operates Aurora maritime patrol aircraft out of Greenwood, Nova Scotia, served only briefly with Coastal Command before becoming a bomber squadron.²⁵ Astonishingly, none of the HWE maritime air squadrons, not even the ubiquitous and highly successful 10 (BR) -- the famous "North Atlantic Squadron" -- was perpetuated in the post war RCAF. This perpetuation of the 400 series squadrons suggested what the RCAF thought of the value and importance of its Home War

²³ Leslie Roberts, *There Shall Be Wings: A History of the Royal Canadian Air Force* (Toronto: Clarke, Irwin & Co. Ltd., 1959).

²⁴ The RCAF's overseas squadrons bore numbers in the 400 to 445 range. This was part of a numbering scheme organised by the RAF in order to avoid the confusion that would be caused by the duplication of squadron numbers by various countries. The RCAF's Number 1 Squadron, for example, became 401 Squadron, RCAF. Numbers 444 and 445 were not used by the wartime RCAF. For details of RAF unit number allocations to various countries during the Second World War, see C.G. Jefford, *RAF Squadrons: A Comprehensive Record of the Movement and Equipment of all RAF Squadrons and their Antecedents since 1912* (Shrewsbury: Airlife, 1988), 112-113. The postwar decision to perpetuate the 400-series squadrons was announced by the RCAF in early 1947. Kostenuk and Griffin, *RCAF Squadrons and Aircraft*, 148, n. 1.

²⁵ This is not to disparage 405's wartime record; it went on to become Canada's only Pathfinder squadron, responsible for the precision marking of targets for other bombers.

Establishment. If the institution itself so strongly rejected the legacy of the HWE, it is no wonder that many subsequent historians rejected it, too.

Two historians who do not reject the role of the Home War Establishment are Larry Milberry and Hugh Halliday. Their book *The Royal Canadian Air Force at War, 1939-1945* was published in 1990.²⁶ Although its greater size and narrower focus give it an advantage over *There Shall Be Wings*, the work itself is far better executed than Roberts' attempt. While the focus is largely on overseas operations, there is considerable space devoted to the activities of the Home War Establishment and Canadian squadrons serving with the RAF's Coastal Command. The profusion of photographs and lack of documentation are largely the product of the book's intended audience – the aviation “buff” rather than the academic historian. The authors make use of a wide variety of sources, including interviews with veterans, but the influence of the official histories is apparent. Milberry numbers Wise's *Canadian Airmen and the First World War* and Douglas' *The Creation of a National Air Force* among the “classics” of RCAF histories, and considers them “prime sources for any fan or student of RCAF history . . . [they] were most useful in the preparation of this book.”²⁷ Given the strengths of Douglas's work, it was no wonder that so much was written about the HWE, since this was the first popular history that benefited from the official history. Milberry and Halliday's work, while perhaps not meeting the strict academic standards of documentation, is without a doubt the best “unofficial” history of the wartime RCAF to date. Events are placed in their context, extensive use is made of first-hand accounts of the war, and the text surpasses the usual

²⁶ Larry Milberry and Hugh A. Halliday, *The Royal Canadian Air Force at War, 1939-1945* (Toronto: CANAV Books, 1990). It is worth noting that Halliday was formerly a member of the RCAF's Air Historical Section, and is a major contributor to the field of Canadian aviation history, especially that of the RCAF.

²⁷ *ibid.*, 9. The impact of Douglas' history on secondary literature can be seen when *The RCAF at War* is compared with Larry Milberry, ed., *Sixty Years: The RCAF and CF Air Command, 1924-1984*, (Toronto: CANAV Books, 1984). Coverage of the HWE, especially its maritime air operations, is more complete in the former than the latter, even when space limitations are considered. This is presumably due to the 1986 publication of the second volume of the RCAF official history and the information it provided for other authors.

narrative found in many histories of the RCAF. Furthermore, operations by 162 (BR) are well documented, both in text and in photographs, and several first-hand accounts of its activities are included, providing information not available in the official history.

While historical work on the RCAF has improved, squadron histories, at least those of most Canadian squadrons, have become stereotypical. Published in a standard size and format,²⁸ they are generally upbeat narratives with little analysis or insight. They appear to have been written using a single historical source, the Squadron's Operational Record Book (ORB), which was a daily diary of events and activities, and have plenty of illustrations thrown in for good measure. One American aviation historian has described similar unit histories as "mainly of the yearbook quality, primarily picture books."²⁹ While these histories may provide a general narrative history of a squadron's activities both during and after the war, they do not encompass all of the RCAF's wartime squadrons. Since each squadron history was produced by the squadron in question, and since, as mentioned above, Home War Establishment squadrons have not been perpetuated by present units, the histories of such squadrons as 162 (BR) and other Home War Establishment squadrons have not been written, even in this limited format.³⁰

There is, however, at least one exception to this rather limited type of squadron history. Hugh Halliday's history of 242 Squadron, RAF, which was early in the war deliberately intended to be a "Canadian" squadron within the Royal Air Force, provides a good example of how a squadron history can be written.³¹ While much of this history is narrative in format, it is properly documented, making use of footnotes and a variety of sources. Halliday also provides analysis and makes critical examinations of the available

²⁸ Which is mainly due to their having been published by the same company.

²⁹ Kenneth P. Werrell, "A Case for a 'New' Unit History," *Air Power History*, 39:1 (Spring 1992), 34.

³⁰ These squadron histories may use other sources, but since no documentation or research notes are provided, it is impossible to determine what they might be.

³¹ Hugh Halliday, No. 242 Squadron, the Canadian Years: The Story of the RAF's 'All Canadian' Fighter Squadron (Stittsville: Canada's Wings, 1981).

records, often making judgments about the relative validity and reliability of various sources. The role of the Canadian and British governments is also examined, since the transformation of 242 Squadron into a “Canadian” unit was brought about largely for political and propaganda purposes. Halliday’s work shows how a squadron history can ascend from the level of an ordinary narrative into an historical examination.

Despite the omissions of the “conventional” squadron histories, a history of 162 (BR) has actually been published. Carl Vincent, in the short-lived Canadian aviation periodical *High Flight*, wrote a two-part history of the squadron in the early 1980s.³² The statements made above about other squadron histories are generally applicable to Vincent’s article, although it must be noted that his narrative is not always upbeat -- the lack of aircraft during the squadron’s early days and the high losses to enemy anti-aircraft fire caused mainly by inadequate armament are subjects that are brought forward. Space considerations obviously limited Vincent’s work, as did the fact that much of the information that would be relevant and useful for a more complete history of the squadron is buried within files not always related directly to 162 (BR). Vincent does a solid job of creating and laying out a narrative, and provides some understanding of the problems faced by the squadron.

The total absence of maritime air squadrons from the popular -- and service -- consciousness calls out for a serious study of such units, and 162 (BR) is a worthy subject. First, as has been mentioned above, little has been written on the history of maritime air operations during World War Two, and much of what has been written suffers from serious deficiencies. If only as a contribution to the history of maritime air power during the war, the history of 162 (BR) would be useful. Second, the squadron’s successes against the U-boat provide a reason to study its history. It is worth studying not only because it was successful, but also in order to determine why it was so successful.

³² Carl Vincent, “Prelude to Glory,” *High Flight*, 1:6 (November-December 1981), 230-236, “Four Weeks in June,” *High Flight*, 2:1 (January-February 1982), 31-37.

Third, information about technical developments and the lack of adequate equipment for some RCAF squadrons can also be examined, albeit within a limited scope. Fourth, a history of the squadron could provide some insight into inter-Allied relations, especially as they applied to the allocation of aircraft and the disposition of the squadrons that used them. Finally, this history should be written, and especially now while those who served with 162 (BR) are still with us to talk about it.

This thesis is an attempt to write a history of 162 (BR)'s entire operational career, in large part to try to explain the squadron's spectacular record against U-boats in the middle of 1944. There were a number of reasons for this success. The first was the German decision in February 1944 to abandon attempts to renew attacks on convoys in mid-ocean.³³ This freed 162 (BR) from much of its task of escorting convoys and eventually allowed its aircraft to operate from Wick, in Scotland, where they were closer to the Norwegian coast and its U-boat bases. An associated factor was the Allied invasion of Europe on 6 June, which resulted in an all-out effort by the U-boats to interfere with the invasion, either by directly attacking the invasion fleet or by attacking ocean convoys and thereby drawing Allied forces away from the invasion area. Coastal Command played a major role in keeping U-boats out of the invasion area, and 162 (BR) was part of these activities, joining in the air offensive against U-boats in the waters off Norway.³⁴ The second reason for 162 (BR)'s success was its well-trained aircrews. After the squadron was posted to Iceland, its crews participated in a two-week anti-submarine course in Northern Ireland, which included practice attacks against a British submarine. Training did not end there, however; crews were on a four-day cycle while on operations, which included a day each of ground training and air training prior to making an operational flight.³⁵

³³ Günter Hessler, The U-Boat War in the Atlantic, 1939-1945, Volume III: June 1943-May 1945, (London: HMSO, 1989), 41-46.

³⁴ Douglas, The Creation of a National Air Force, 592.

³⁵ "Interview by Roger Sarty with S.E. Matheson, 14 June 1993," DHist Biographical File.

The third reason for the squadron's success was not directly related to any of 162 (BR)'s characteristics, although the squadron itself was part of the reason. Overwhelming Allied air power in the waters off Norway contributed to 162 (BR)'s sinkings of U-boats. The captain of *U-715*, which was sunk on 13 June 1944, was so certain that Allied aircraft were aware of his location that he decided to surface and fight it out with an aircraft rather than remain submerged and attempt to escape.³⁶ Likewise, *U-478* would not have been sunk if other Allied aircraft had not been in the area; the depth charges on the *Canso* "hung up" and refused to drop when it attacked the submarine, so a Liberator from 86 Squadron was homed in to destroy the submarine, for which 162 (BR) was given partial credit.³⁷ Had other Allied aircraft not been nearby, the U-boat might have escaped destruction.

The reasons for 162 (BR)'s deployment to Iceland must also be explored. When discussions about the squadron's posting to Iceland began, Allied convoys in mid-ocean were not adequately supplied with coverage by anti-submarine aircraft. The single very long range (VLR)³⁸ squadron in Iceland was hard-pressed to provide adequate coverage for all convoys, and the British and American medium range (MR) squadrons of Hudsons and Venturas were unable to provide coverage in areas where the U-boats were now

³⁶ Survivors from *U-715* were rescued, and provided this information. "The End of 'U715'," Coastal Command Review, 3:7 (July 1944), 8, DHist 181.003 (D963); Details of Attack on *U-715*, NAC RG 24, vol. 11464, file "A/S War (1939-1945) Details of Attacks".

³⁷ Douglas, The Creation of a National Air Force, 595. It could be argued, however, that had another aircraft not been available, another attack might have been made by the *Canso*. This would probably have resulted in the loss of the aircraft, which had been damaged by flak during its first attack, and might not have sunk the U-boat, since the depth charges might well have hung up again.

³⁸ Only VLR aircraft could provide land-based air cover in the mid-Atlantic. The Consolidated B-24 Liberator was the most suitable aircraft for this task, and it was in fact the only type of VLR aircraft during the war. Modifications to increase fuel capacity and decrease weight increased its range to 2300 to 2600 miles, which allowed patrols to be carried out some 700 to 1000 miles from shore bases. Douglas, The Creation of a National Air Force, 522. For technical specifications on the LR and VLR Liberators in Coastal Command service, see Great Britain, Air Ministry, Air Historical Branch, "The RAF in Maritime War, Volume IV: The Atlantic and Home Waters - The Offensive Phase, February 1943 to May 1944," app. X, "Coastal Command Liberator Standards," DHist 79/599.

operating.³⁹ When the Americans withdrew their Venturas from Iceland as part of a reorganisation of their maritime patrol deployments, the need arose for a squadron to take their place. Following the withdrawal of the U-boats from the Atlantic convoy routes in mid-1943 and the unsuccessful attempt to renew the offensive in September of that year, the Canadian coast was not significantly threatened, and it was determined that the RCAF's Home War Establishment had too many long range (LR) squadrons for the threat it faced. Requests were made by the British that the RCAF make one of its Canso squadrons available for operations outside of Canada, and it was 162 (BR) that was sent to bolster the forces in Iceland.

The success that the squadron encountered in 1944 tends to overshadow the problems that it faced in merely trying to carry out its mission. When these factors are considered, 162 (BR)'s accomplishments seem even more extraordinary. Throughout most of its early operational life in Canada, the squadron was plagued by a lack of aircraft. Furthermore, some of its early planes, especially those manufactured at Boeing's Vancouver plant, suffered from numerous deficiencies. These problems did not affect 162 (BR) alone; 5 (BR) reported numerous problems with Boeing-built Canso "A"s that it received in April of 1943. "This Unit," it reported, "has presently received seven Aircraft off the Boeing Contract and one off the Canadian Vickers contract. The Boeing built aircraft have been the most unsatisfactory to date."⁴⁰ Boeing-built aircraft were also delivered lacking essential equipment as well as being mechanically deficient, but this problem was rectified later in the war.

In addition to problems of supply and quality of aircraft, 162 (BR) faced other problems that are not discussed in the much of the literature. Price's *Aircraft Versus*

³⁹ The main reason why the MR (medium range) squadrons were unable to patrol in areas where U-boats were operating was because of the squadrons' prior successes against them, which forced the U-boats to operate further from Iceland.

⁴⁰ "Memorandum: Defects Discovered During Acceptance Checks of Canadian Built Canso "A" Aircraft," 28 April 1943. National Archives of Canada, RG 24, vol. 4969, file 606-38HK, vol. 1 "Aircraft: Consolidated PBY, Contracts for Supply of."

Submarine, for example, suggests that antisubmarine aircraft were universal beneficiaries of modern equipment and armament, and that their successes against the U-boats can be attributed to these factors. This was not the case for 162 (BR). By 1944, their Cansos carried an antiquated surface search radar, Mark II ASV, which could be readily detected by U-boats, unlike the newer models of radar which also possessed greater accuracy and were better able to detect surface targets. By 1944, Mark II ASV was useful only for navigational purposes and for frightening U-boats with its emissions. The squadron did, however, receive the Mark 24 Mine, an anti-submarine homing torpedo, and radio sonobuoys (RSBs) for use with it.⁴¹ For a variety of reasons that will be explored, the Mark 24 Mine met with no success against U-boats when used by 162 (BR), and with little success when used by the rest of the RCAF. Contrary to Price's assertions, the Mark 24 Mine was not a panacea for anti-submarine aircraft. Instead, 162 (BR) scored all of its victories with the simple air-dropped depth charge.⁴²

A major shortcoming of Cansos in all RCAF squadrons was their inadequate frontal armament. Prior to late 1944, this consisted at best of two .303 Browning machine guns mounted in the bow of the aircraft used to suppress the enemy's anti-aircraft fire. The machine guns were outranged by the 37mm and 20mm anti-aircraft guns of the U-boats, whose tactics by the summer of 1943 consisted of staying on the surface when attacked by aircraft and attempting to shoot the attacker down. The Canso's armament, already inadequate for the job, suffered from problems that further reduced its effectiveness; these problems, their consequences, and their eventual solution will be explained in the pages that follow.

⁴¹ RSBs consisted of an hydrophone (underwater microphone) and a radio transmitter. Dropped from an aircraft, they allowed an operator on board to listen for the sounds made by enemy submarines and hence allowed the tracking of submerged U-boats, something not previously possible. Once its position was established, attacks could be made on the submarine using the Mark 24 Mine. See Appendix C for a discussion of the Mark 24 Mine and the sonobuoy.

⁴² In some cases, this lack of success was because its target was not a U-boat. This problem of bogus sightings will be discussed in Chapters 7 and 8.

There were other problems in addition to those of inadequate armament, and most of these were caused by the squadron's deployment to Iceland. Although the squadron relied on Eastern Air Command facilities in the Maritimes for essential repair and routine maintenance, its Cansos were unable to make a direct flight from Reykjavik to Canada. Instead, they had to fly a lengthy route from Reykjavik to Bluie West 1 in Greenland, from there to Goose Bay, then on to Gander, and from there to bases in Canada.⁴³ This route was often blocked by bad weather, resulting in long transit times, with the aircraft unavailable either for repairs or for operations. Major overhauls on 162's Cansos were carried out at No. 4 Repair Depot in Scoudouc, New Brunswick. Not only did the time needed to fly the aircraft back to Scoudouc reduce the number of aircraft available, but the need to leave sufficient "flying time" on the aircraft's engines for the return to Canada and the time taken to fly back to Iceland reduced the time available on each aircraft for operational use.⁴⁴ This was not the only maintenance problem faced by the squadron. Even minor maintenance required that spare parts be provided from Canada, since the RAF operated no Canso "A"s and hence could not provide many necessary parts. Even if the RAF could have supplied them, it was the RCAF that was responsible for 162's supply of spares while the squadron was in Iceland. Its Cansos and the RCAF's transport squadrons therefore assumed the responsibility for supplying 162's needs while it was in Iceland. Due to the limited capabilities of Eastern Air Command's transport squadrons until late 1944, however, the supply of spares was an almost constant problem during 162's stay in Iceland.⁴⁵ These problems were considerable; when they are taken into account, the squadron's accomplishments seem even more impressive.

⁴³ Bluie West 1 was located at Narsarssuaq, towards the southern tip of Greenland, on its western coast.

⁴⁴ Aircraft were (and still are) overhauled and repaired after a given time spent flying, much like the service intervals based on mileage for automobiles.

⁴⁵ Reliable air supply to Iceland required transport versions of the Liberator bomber, and these did not enter service with the RCAF until October 1944, when the first Liberator of 168 (Heavy Transport) Squadron made an Atlantic crossing. C.R. Vincent, Canada's Wings, vol. 2: Consolidated Liberator & Boeing Fortress, (Stittsville, Ont: Canada's Wings, 1975), 135;

The beginnings of 162 (BR) are outlined in Chapter 1, which examines the origins of Eastern Air Command and the creation of a Canso unit in Yarmouth, Nova Scotia in early 1942. Chapters 2 and 3 detail the early problems and growing pains of the squadron, while Chapters 4 and 5 cover the move to Iceland and early successes against the enemy. The events of June 1944, the high point of the squadron's career, are examined in Chapter 6. Chapter 7 covers the beginnings of the inshore U-boat campaign and its effect on maritime air operations in the North Atlantic, and Chapter 8 brings the history of 162 (BR) to the end of the war, its return to Canada, and its eventual disbandment in August 1945. Hopefully, this examination of Number 162 (Bomber Reconnaissance) Squadron will salvage an important episode in Canada's modern history that has been ignored by historians for too long.

Kostenuk and Griffin, RCAF Squadrons and Aircraft, 73. Only the Liberators could make a non-stop flight from Gander, Newfoundland to Reykjavik; the shorter-ranged twin-engine Douglas Dakotas could make the trip in stages via Goose Bay and Bluie West 1, but safety considerations meant that EAC would only approve such flights if "an extreme emergency exists and no alternate means of transportation to Iceland is available." CAS to AOCinC, EAC, "Air Shipments to Iceland," 20 July 1944, DHist 181.003 (D4864).

Chapter 1

Premature Birth: the Origins of 162 (BR), September 1939 - May 1942

Fenced by your careful fathers, ringed by your leaden seas
Long did ye wake in quiet and long lie down at ease;
Till ye said of Strife, "What is it?" of the Sword, "It is far from our ken";
Till ye made a sport of your shrunken hosts and a toy of your armed men.

Kipling, "The Islanders"

Number 162 (Bomber Reconnaissance) Squadron, Royal Canadian Air Force (RCAF), owed its origins to the expansion of the RCAF during the Second World War. When Canada declared war against Germany on 10 September 1939, the RCAF had a strength of 4153 officers and men, and some 275 aircraft in service. Of its personnel, 235 were pilots; there were actually more Canadians serving as pilots in Britain's Royal Air Force (RAF) at the time. Of the RCAF's aircraft, 157 were service types, ranging from the modern Hawker Hurricane to the antiquated Westland Wapiti and Vickers Vancouver, while the remainder were training aircraft. The RCAF claimed that fifty-three of the service types were "able to take their place on active service," but less than forty of these could be considered combat-worthy; the rest were all too antiquated to see service against the enemy.¹ Plans were underway, prompted by the deteriorating international situation, to expand the RCAF to a strength of twenty-three squadrons. While six of these were to become bomber and army co-operation squadrons for service with an expeditionary force, the other seventeen were to remain in Canada as part of a national defence plan. Of these seventeen squadrons, some were to be composed of fighter aircraft for dealing with an

¹ Larry Milberry and Hugh A. Halliday, The Royal Canadian Air Force at War, 1939-1945, (Toronto: CANAV Books, 1990), 17; 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), 343. The Hawker Hurricane, of which the RCAF had nineteen, was then in front-line service with the RAF. The RCAF had ten Fairey Battles, which were considered modern aircraft, but which were withdrawn from combat following their disastrous combat record in the Battle of France in 1940. Six Blackburn Sharks, roughly equivalent to the British Fairey Swordfish, could also conceivably be classed as combat aircraft. Other aircraft types, despite their obsolescence, continued to serve until well into the war. The Stranraer flying boat, for example, served until 1944 on Canada's West Coast.

enemy air threat, while others were to be bombers for attacking an invading enemy, and still others were to be used in co-operation with Canadian ground forces. While it may seem unusual to have planned to keep so many squadrons in Canada while the war was expected to be fought in Europe, these forces were intended to be able to meet the “maximum scale of attack” laid down in prewar assessments. This was expected to consist of bombardment by two cruisers armed with eight-inch guns or by one battleship, and of landings by small raiding parties. The provision of so many squadrons for home defence was also the product of prewar attitudes, since, as W.A.B. Douglas explains in the official history, “Home Defence was the principal justification for the RCAF after 1935. Overseas commitments were not in favour . . .”² It is interesting to note that the greater threat was presumed to be posed by surface ships and not by submarines. As events proved, submarines were by far the greater threat with which the air force had to contend.

The defence plans also provided squadrons for operations against enemy ships and submarines. This last type of squadron, with a few exceptions, was to be the only element of the RCAF’s Home War Establishment (HWE) to see active service against the enemy.³ The air force referred to them as Bomber Reconnaissance (BR) squadrons. Beginning with obsolete biplanes in September 1939, these squadrons would find themselves equipped by May 1945 with modern aircraft, including Very Long Range (VLR)⁴ Liberators which

² *ibid.*, 343-348, 341. See Michael L. Hadley, U-Boats Against Canada: German Submarines in Canadian Waters, (Kingston: McGill-Queen’s University Press, 1985), 27-28 for more detail on these defence plans, and *ibid.*, 21-51 for an overall discussion of Canadian naval defence planning during the Second World War.

³ Aircraft from British Commonwealth Air Training Program (BCATP) bases were sometimes pressed into service in anti-submarine operations, as were some aircraft from fighter squadrons. Army co-operation squadrons also participated in the war against U-boats. A Lysander from No. 2 Coast Artillery Co-Operation (CAC) squadron, flying from Dartmouth, actually managed to damage U-96 off Halifax in 1942. Fighters and bombers of Western Air Command saw service in the campaign against the Japanese in the Aleutian islands. Douglas, The Creation of a National Air Force, 488-498, 411-420. Some HWE fighter squadrons were also sent overseas later in the war; 125 Squadron became 441 Squadron, and 127 Squadron became 443 Squadron. Samuel Kostenuk and John Griffin, RCAF Squadron Histories and Aircraft, 1924-1968, (Toronto: Samuel Stevens Hakkert & Company, 1977), 59-60.

⁴ Only VLR aircraft could provide land-based air cover in the mid-Atlantic. The Consolidated B-24 Liberator was the most suitable aircraft for this task, and it was in fact the only type of VLR

could cross the North Atlantic on their missions against the German U-boats which threatened the Allied lifeline to Britain. This lifeline was always threatened, and came close to being broken during six years of war. In some ways, the threat appeared to mirror the events of the First World War. In 1917, Britain had only narrowly averted defeat at the hands of Germany's submarines, the U-boats. In 1939, the U-boat threat reappeared within hours of the outbreak of war. The sinking of the passenger liner *Athenia* by *U-30* on 3 September served notice to Britain and the Allies that once again German submarines would wage unrestricted warfare against merchant shipping. The convoy system was promptly implemented, but aerial protection for these convoys was limited, mainly by the kind of aircraft available for maritime patrol work.⁵

Little time was lost in providing aerial escort for convoys in Canadian waters. The first HX (Halifax-United Kingdom) convoy, which sailed on 16 September, was escorted by Supermarine Stranraer flying boats of Number 5 General Reconnaissance (GR) Squadron. These aircraft also swept the approaches to Halifax, searching for U-boats, but their limitations soon became apparent. They were capable of operating in daylight only, and could patrol to an operational radius of just 250 nautical miles. While this was limited in comparison with later aircraft, it was a far better performance than other RCAF squadrons on Canada's East Coast could muster. Number 10 (BR), for example, flew the

aircraft during the war. Modifications to increase fuel capacity and decrease weight increased its range to 2300 to 2600 miles, which allowed patrols to be carried out some 700 to 1000 miles from shore bases. See Douglas, The Creation of a National Air Force, 522.

⁵ Douglas, "The Air Weapon in Defence of Shipping, 1914-1945," (Ottawa, 1 April 1986), DHist 86/500, 13. The majority of the squadrons in the Royal Air Force's Coastal Command available for convoy protection and anti-submarine work, for example, were equipped with the Avro Anson, which was in most respects less effective than the First World War's Blackburn Kangaroo. For a brief discussion of Coastal Command's unpreparedness and lack of adequate equipment, see Great Britain, Air Ministry, Air Historical Branch, "The RAF and Maritime War, II: The Atlantic and Home Waters - The Defensive Phase, September 1939 to June 1941," 1-2, DHist 79/599. U-boat is an abbreviation of the German term *Unterseeboote* (Undersea Boat), or submarine. U-boats were given numbers, such as *U-30*. Sometimes, for reasons of security, German documents referred to U-boats by their commander's name instead of by their number.

ancient Westland Wapiti.⁶ They flew few maritime patrol missions; this was due partly to the limited range and weapons capacity of its single-engined biplanes, but was mainly due to their unreliability. One pilot from 5 (BR) stated that “had they used them, we would have been doing nothing but search and rescue missions looking for them.”⁷

These operations on the East Coast were under the control of the Royal Canadian Air Force’s Eastern Air Command. The RCAF had gained its independence from the army in 1938, and regional commands were established almost immediately thereafter. Western Air Command (WAC) was created on 1 March, while Eastern Air Command (EAC) was created on 15 September.⁸ EAC began the war with few aircraft in position and few air bases ready for operations. Although sites had been surveyed beginning in 1937, and contracts let for the construction of bases at Sydney, Yarmouth, and Debert, Nova Scotia (see Map 1) in January of 1939, the outbreak of war found these bases unfinished, largely due to difficult terrain. As a result, at the end of August 1939 only 5 (GR) at Dartmouth, NS, was ready for war operations, possibly because its Stranraer flying boats did not require an airfield, although they did require mooring sites and service facilities ashore. Number 3 (Bomber) Squadron arrived in Halifax with its Wapitis on 1 September, and was redesignated 10 (BR) on the 5th. Because no proper facilities were available, the squadron

⁶ GR is an abbreviation of General Reconnaissance, the Royal Air Force designation for squadrons carrying out maritime air patrols and anti-submarine missions. The RCAF replaced “General Reconnaissance” with “Bomber Reconnaissance” on 31 October 1939. Douglas, The Creation of a National Air Force, 378-379; Kostenuk and Griffin, RCAF Squadrons and Aircraft, 20. The term “operational radius” is explained in Appendix B. The RCAF had acquired used Wapitis from the RAF in 1935 and 1937. The Wapiti was essentially a redesigned and updated DeHaviland DH9, an aircraft that had seen service in the First World War. They were bought despite their complete obsolescence because the Canadian government was unwilling to spend money on more modern aircraft for the RCAF. It was quickly given the name “What-a-pity” by RCAF personnel. Douglas, The Creation of a National Air Force, 141-142; Milberry and Halliday, The RCAF at War, 101.

⁷ Leonard J. Birchall, “Trenton to Dartmouth: An Anecdotal Account of Flying in the RCAF, 1937-40,” CAHS Journal, 23:2 (Summer 1985), 54.

⁸ Douglas, The Creation of a National Air Force, 373.

operated from the Halifax municipal airport, a grass strip that had previously seen use as a cow pasture.⁹

By the end of 1939, improvements in the form of modern aircraft were on their way to Eastern Air Command's Bomber Reconnaissance squadrons. Number 11 (BR) arrived at Dartmouth in early November equipped with Lockheed Hudsons, a maritime patrol aircraft that was a modified civil airliner. With a greater effective range than the Stranraer, and almost twice its top speed, the Hudson was the RCAF's first modern maritime patrol aircraft.¹⁰ Shortly thereafter, 10 (BR) cast off its Wapitis, and replaced them with Douglas Digbys, an American-built bomber and patrol aircraft which was designated B-18A in United States Army Air Force (USAAF) service. Like the Hudson, the Digby was based on a civil airliner, in this case the DC-2. Also like the Hudson, the Digby was an aircraft far more modern than the RCAF's earlier equipment. Clare L. Annis, who was serving as a Flying Officer (F/O) with 10 (BR) at the time, commented that

Like almost every other regular force pilot in the RCAF at the beginning of the war, I had never before been in the cockpit of an aircraft having such things as a steering column and wheel, brakes, flaps, retractable undercarriage, adjustable pitch propellers, carburettor mixture and heat controls and so on, along with a great many new dials that went with them.¹¹

With the entry of these new aircraft into service, the RCAF for the first time had the ability to carry out adequate maritime patrols.¹² While these aircraft could provide coverage, their crews, as well as the organisation that supported them, needed training before they could become truly effective.

⁹ *ibid.*; Kostenuk and Griffin, RCAF Squadrons and Aircraft, 24,31, C.L. Annis, "Eastern Air Command, Recalled," in I'll Never Forget . . . Canadian Aviation in the Second World War (Toronto: Canadian Aviation Historical Society, 1979), 61.

¹⁰ The Hudson had an effective range of 350 miles versus 250 for the Stranraer, and a maximum speed of 230 knots as opposed to 130. Douglas, The Creation of a National Air Force, 379.

¹¹ Annis, "Eastern Air Command, Recalled," 63.

¹² Douglas, The Creation of a National Air Force, 379-380.

These deficiencies became apparent in February and March of 1941 when the German battlecruisers *Scharnhorst* and *Gneisenau* attacked merchant shipping in the western Atlantic. On 15-16 March the two ships were some 350 miles southeast of St. John's, where they captured or sank sixteen vessels from two convoys.¹³ They were also within the operational range of 10 (BR)'s Digbys. Two Digbys that were heading out to escort one of the convoys were informed that an attack was in progress, but they flew away from the armed merchant cruiser conveying this information without finding out the position at which the attack was occurring. They then proceeded to escort the wrong convoy, which was already accompanied by the battleship HMS *Rodney*, while several miles away the other convoy, to which they had been assigned, lost several ships. The *Scharnhorst* and *Gneisenau* avoided detection by the RCAF, and returned to France without suffering any damage.¹⁴ The actions of the two aircraft were perhaps the low point of Eastern Air Command's war record. The apparently deliberate failure of the two Digbys to locate the two raiders made it difficult for any measures to be taken against them, and placed yet more Allied shipping at risk. It also highlighted an apparent lack of combat readiness in Eastern Air Command. In the official history, Douglas states that

The failure to press on towards the enemy and pass appropriate information was a grievous error that raises questions about the training of the air crews and the efficiency of the ground staff who had briefed them. Perhaps the routine of flying patrols in a theatre which experienced only rare and fleeting enemy encroachments had dulled operational perspectives and readiness. In that case, commanders at all levels had not exercised proper leadership and supervision.¹⁵

EAC's need for training was to be demonstrated again in the months to come when the U-boat offensive moved into its area of operations.

Although Eastern Air Command's maritime air forces were increasing and modernising with considerable speed by 1940, its obligations were increasing at an even

¹³ *ibid.*, 384.

¹⁴ *ibid.*, 384-385. For a brief account of the battlecruisers' actions at this time, see Richard Garrett, *Scharnhorst and Gneisenau: The elusive sisters* (Vancouver: David & Charles, 1978), 66-67

¹⁵ Douglas, *The Creation of a National Air Force*, 385.

greater rate. Talks prompted by the outbreak of war led to a Canadian commitment to the defence of Newfoundland. In addition to the Army's provision of ground troops to defend strategic points around the island, Eastern Air Command made preparations to station aircraft at the Newfoundland Airport at Gander. German successes in Europe created fears that the airport at Gander might be occupied and used to mount air attacks against eastern Canada. These concerns prompted EAC to station a detachment of 10 (BR)'s Digbys at Gander in June of 1940. On 10 June, the expanding RCAF commitments in Newfoundland led to the organization of 1 Group, with headquarters in Saint John's. It controlled all of the RCAF units in Newfoundland, especially those operating in conjunction with the Royal Canadian Navy's Newfoundland Escort Force, which had been formed in May. The construction of an airport at Torbay, near St. John's, and the development of command and communications networks was another task undertaken by the new organization.¹⁶ Eastern Air Command's strength was bolstered by American forces that were also arriving in Newfoundland. A United States Army Air Force (USAAF) reconnaissance unit, equipped with B-18s, arrived at Gander in May, and was replaced by a unit operating B-17Bs in August. Despite America's status as a neutral, the aircraft carried out reconnaissance operations and even made some attacks in support of the United States Navy's "short of war" operations on the eve of hostilities with Germany. Even in 1942, however, after the declaration of war between the United States and Germany, the strength of the USAAF detachment at Gander seldom exceeded one squadron. These forces were augmented by the United States Navy (USN), which also operated maritime patrol aircraft from Newfoundland. Consolidated Catalinas and Lockheed Hudsons were based at the USN's new base at Argentia from May 1941 onwards, providing convoy protection.¹⁷

¹⁶ *ibid.*, 380-381, 387.

¹⁷ Wesley Frank Craven and James Lea Cate, The Army Air Forces in World War II, Volume I: Plans and Early Operations, January 1939 to August 1942, (Chicago: University of Chicago Press, 1948), 156-157, 535, Samuel Eliot Morison, History of United States Naval Operations in

While there was still a perceived need for fighter aircraft to defend Canada against the possibility of attack from the air, much of EAC's growth occurred in its maritime patrol ability. The RCAF had been demanding longer-ranged and more capable patrol aircraft, a demand supported by a recommendation of the Canadian-American Permanent Joint Board on Defence (PJBD), a committee that had been set up in August of 1940 to deal with joint Canadian-American defence issues.¹⁸ The PJBD recommended at its first meeting that the RCAF receive twelve Consolidated PBV-1 Catalina flying boats from American and British allocations, in order to increase its effective maritime patrolling range. Disagreements between the British and Americans held up the delivery of these aircraft. None had arrived by March of 1941, and orders placed separately by the RCAF were not likely to be filled before the fall of the year. The same month, British concerns about the westward expansion of U-boat operations in the Atlantic, and about EAC's ability to meet the onslaught, provided Air Marshal L.S. Breadner, Chief of the Air Staff in Canada, with additional reasons to support his demand for three squadrons of long-range flying boats in order to meet operational commitments.¹⁹ In May of 1941, U-boat operations spread to west of 35° West in the North Atlantic in an attempt to locate "soft spots" in the Allied defences. An attack on convoy HX 126 on 20 May demonstrated the threat posed by the new deployment. These submarines were operating out of the effective range of EAC's Digbys and Hudsons, and the attack on the convoy finally convinced the British to allocate nine Catalinas to the RCAF. These aircraft began to arrive in June, and eventually

World War II, Volume I: The Battle of the Atlantic, September 1939-May 1943, (Boston: Little, Brown and Company, 1966), 154, 248; Great Britain, Air Ministry, Air Historical Branch, "The RAF in Maritime War, III: the Atlantic and Home Waters - the Preparative Phase, July 1941 to February 1943," 21-22, DHist 79/599.

¹⁸ For a discussion of the background to and establishment of the PJBD, see C.P. Stacey, Arms, Men and Governments: The War Policies of Canada, 1939-1945, (Ottawa: Information Canada, 1974), 336-354.

¹⁹ Douglas, The Creation of a National Air Force, 385.

equipped 116 (BR).²⁰ By the fall of the same year, Catalinas began to arrive from Canadian orders placed in the United States. The RCAF gave them the designation “Canso” in December, and examples of the Canso “A”, the amphibious version of the Catalina, began arriving shortly afterwards.²¹ The arrival of these long-range aircraft was welcome, since EAC was beginning to encounter U-boats in its operational area as the Battle of the Atlantic moved westward. Squadrons equipped with Catalinas and Cansos would allow the command to meet the threat further from Canadian shores and provide convoy coverage at greater distances from EAC bases. One of the squadrons eventually formed to use the new aircraft was 162 (BR), which was to use the Canso “A” exclusively throughout its career.

Eastern Air Command made its first attack on a U-boat on 25 October 1941 as a result of a new U-boat deployment that had begun in early September. This attack deserves a brief examination because it demonstrates some of the problems faced by EAC in its war against the U-boats. The most notable of these problems was the need for proper training, which had already been demonstrated during the incursion of the *Scharnhorst* and *Gneisenau* into the western Atlantic. The effect of adverse weather and the lack of suitable antisubmarine armament was also apparent. In late October, the RCN’s Operational Intelligence Centre (OIC) in Ottawa had been notified by the Admiralty that several U-boats were moving westward toward the Strait of Belle Isle.²² On the 24th, the presence of four U-boats to the east of the strait was confirmed, and both 10 (BR) in Gander and the

²⁰ *ibid.*, 385-387; Air Ministry, “The RAF in Maritime War,” II, 302; Air Ministry, “The RAF in Maritime War,” III, 22-23; Günter Hessler, The U-Boat War in the Atlantic, 1939-1945, Volume I: 1939-1941, (London: HMSO, 1989), 73.

²¹ Douglas, The Creation of a National Air Force, 485. An amphibian is an aircraft capable of operation from both land and water. In this case, the amphibious version of the Canso was the flying boat equipped with landing gear. The designations “Canso” and “Canso ‘A’” mirror the U.S. nomenclature of PBV-5 and PBV-5A for the flying boat and amphibian versions of the same aircraft.

²² One of the primary functions of the Operational Intelligence Centre was the use of decrypted U-boat signals and other sources of information to track the position of U-boats and change the routes of convoys to avoid them.

detachment of 116 (BR) based at Botwood were alerted. These four boats were Group *Mordbrenner*, which had arrived on station on 16 October. They would soon be joined by others.²³ Westbound convoy ON 26 was steaming into the area, and an all-out effort by the two squadrons on the following day put seven of 10 (BR)'s Digbys and two of 116 (BR)'s four Catalinas in the air. Some provided cover for the convoy while the others flew searches. The weather was terrible, and gives some indications of what EAC aircrew could face while in the air; 60-knot southerly winds, a 1,000-foot ceiling, updrafts, and salt spray that clouded an aircraft's windshield even at 600 feet.²⁴ While patrolling in such weather might have seemed pointless, one of the crews made EAC's first sighting and attack on a U-boat. Some 125 miles east of the Straits of Belle Isle, Digby 740 of 10 (BR), flown by Squadron Leader C.L. Annis, spotted and attacked *U-208*.²⁵

The submarine had submerged by the time Annis had reached its position, but since all of the bombs were set to "safe" this was immaterial to the outcome of the attack. All of them had been defused by the bomb-aimer as the aircraft closed on its target in accordance with instructions that forbade the carrying of armed bombs on board an aircraft below a given altitude. As the official history observes,

²³ *ibid.*, 481; Marc Milner, North Atlantic Run: The Royal Canadian Navy and the Battle for the Convoys, (Markham, Penguin Books, 1990), 83; Hadley, U-Boats Against Canada, 23-26. Group *Mordbrenner* consisted of *U-573*, *U-374*, *U-208*, and *U-109*. These four U-boats were the last members of a patrol line that had been operating off Iceland and Greenland since early September. In mid-October, after many of the boats had been forced to return to base due to fuel shortages, the four that remained were ordered to investigate the traffic off the Strait of Belle Isle, since BdU had long been interested in it. Jürgen Rohwer and G. Hummelchen, Chronology of the War at Sea, 1939-1945, Volume One: 1939-1942, (New York, Arco Publishing, 1972), 144. Hessler, The U-Boat War in the Atlantic, I, 83-84.

²⁴ Annis, "Eastern Air Command, Recalled," 64. It should be noted, however, that Annis described the severity of the salt spray as unique in his experience.

²⁵ Douglas, The Creation of a National Air Force, 481. Annis, who was at that time EAC's armament officer, was a former member of the squadron and would later return to command it on two separate occasions. Kostenuk and Griffin, RCAF Squadrons and Aircraft, 31. Annis had travelled to Gander as part of a court of enquiry into the destruction of three Digbys by the same pilot, and since 10 (BR) was short of pilots and he was qualified as a Digby pilot, he took 740 out on patrol. Annis, "Eastern Air Command," 64. The Digby was described by *U-208* as a Martin B-26 bomber that suddenly emerged from low cloud cover. Hadley, U-Boats Against Canada, 25.

It was the kind of mistake that crew training in operational training units [OTUs] was designed to avert, but Eastern Air Command had no resources for OTUs. Squadron commanders were merely urged to advance aircrew effectiveness by any means available. It was clear that such instructions were not easy to implement even if the will do so so existed.²⁶

Annis, while later describing the experience as “very exciting but withal very frustrating”, mused that “perhaps . . . [in disarming the bombs the bomb-aimer] . . . saved all our lives in what probably would have proven a vain attempt to sink the U-boat”,²⁷ since the bombs carried on board the Digby were not designed specifically for anti-submarine use and “there was a written warning in the armament instructions that, if one of these bombs were released below 500 feet, its detonation upon impact was apt to blow up the aircraft above it.”²⁸ Eastern Air Command had already taken steps to replace the 600-lb bomb used in this attack and other unreliable anti-submarine weapons with the British Mark VIII 250-lb Amatol filled aerial depth charge, which was to be produced in Canada, and had ordered fittings from the United Kingdom to convert the naval Mark VII 450-lb depth charge for aerial use. Both of these weapons came into widespread use in most EAC squadrons by the end of 1941.²⁹

The weather brought a complete end to flying on 26 October, and in the meantime the four *Mordbrenner* boats were joined by others until a total of eighteen were within range of Eastern Air Command patrols. The weather that prevented flying also interfered

²⁶ *ibid.*, 64-65, “Interview with Air Marshal C.L. Annis covering his experiences in EAC and as Director of A/S Operations during WW II,” 5, DHist Biographical File, “Annis, Clare Levi”; Douglas, The Creation of a National Air Force, 482-484.

²⁷ Annis, “Eastern Air Command, Recalled.” 65.

²⁸ They were, apparently, modified American 600-lb general purpose bombs. According to one account, EAC was using them because they had been provided along with the Digbys. *ibid.*, 64.

²⁹ Douglas, The Creation of a National Air Force, 485. Eastern Air Command was apparently using the grossly ineffective British 100 lb. anti-submarine bomb at the beginning of the war, but this, like the bombs in the Digbys, was replaced by depth charges. F/O H.A. Halliday to A/M C.L. Annis, “History - Eastern Air Command,” 24 August 1964, DHist Biographical File. For details on the 100 lb. A/S bomb and its problems, see Air Ministry, Armament, Volume I: Bombing Equipment, 30-39, DHist. The replacement of this weapon with depth charges in Coastal Command service is briefly described in Air Ministry, “The RAF in Maritime War,” II, Appendix IV, “Depth Charge Development,” 380-381.

with U-boat operations, but one boat, *U-374*, sighted convoy SC 52 fifty miles off St. John's on 1 November. The submarine began to shadow the convoy, homing in other U-boats to participate in the attack. Operations against other convoys were immediately suspended, and *U-374* and eleven other U-boats formed a new group, *Raubritter*, to engage the convoy. Two days later battle was joined despite the poor weather that hampered both German and Allied efforts. Although Allied authorities were aware of U-boat dispositions thanks to "special intelligence,"³⁰ the convoy could not be routed to avoid the enemy, and the British, fearing heavy losses in a running battle across much of the Atlantic, ordered SC 52 to return to Canada. In any event, the U-boats lost contact with the convoy on the 3rd and did not locate it again, and the following day the action was called off. Even so, the U-boats sank four ships and nautical accidents claimed two more as the convoy passed through the Straits of Belle Isle. SC 52 was the only transatlantic convoy to be forced back by U-boat action during the war.³¹

Eastern Air Command had been ordered to support SC 52, and had received orders to supply the maximum possible air support to the convoy beginning 3 November, but the weather did not permit flying until two days later, by which time the battle was already over. By the 19th the weather had deteriorated even further with the onset of winter, and 116 (BR)'s detachment at Botwood, plagued with serviceability problems, was sent to Nova Scotia for the winter since its Catalina flying boats could no longer operate from Newfoundland waters. By this time over a third of 10 (BR)'s fifteen Digbys were also out

³⁰ "Special Intelligence" was used to refer to the Allied decryption of the various ciphers used by German forces during the Second World War. These were of immense importance. With some exceptions, the Enigma cipher machine was used by German forces, and so these decrypts are often referred to as "Enigma intercepts" or "Enigma decrypts". The Allies used the code name "Ultra", which reflected the tremendous security surrounding this accomplishment, to refer to the information gained by these means. British cryptanalysts read every U-boat message from May 1941 to the end of the year. Milner, *North Atlantic Run*, 40.

³¹ Hessler, *The U-Boat War in the Atlantic*, I, 83-84; Milner, *North Atlantic Run*, 83; Douglas, *The Creation of a National Air Force*, 484; Rohwer and Hummelchen, *Chronology of the War at Sea*, 148. Rohwer and Hummelchen state that five ships were sunk by enemy action, while the others give the number as four.

of service, and the squadron did not have enough crews for its remaining aircraft. Fortunately for EAC, a planned U-boat offensive in late November never came to pass. Eastern Air Command had had its first encounter with the enemy, and the unsuccessful attack on *U-208* showed that its equipment and training left much to be desired. Its inability to provide cover for a heavily threatened convoy also demonstrated that flying conditions on the Atlantic coast, especially around Newfoundland, could prevent flying at a time when air support was badly needed.³²

More than five months were to pass before the first U-boats were sunk by aircraft in North American waters, and in both cases it was the United States Navy and not Eastern Air Command that scored the successes. On 1 March 1942 a Hudson aircraft of USN squadron VP-82 flying from Argentia, Newfoundland, sank *U-656*. On 15 March a PBX-3 of the same squadron sank *U-503*. The USN had selected Argentia as a base for convoy escorts in 1940. Construction of the base began in December of the same year, and the first American forces arrived in February of 1941. In May 12 Catalinas and a depot ship were based in the harbour, and by July a Naval Air Station and Naval Operating Base had been commissioned, although the base was not yet completed. Aircraft based at Argentia covered convoys, especially during escort group changeovers at WESTOMP, the point where American escort groups took over and relinquished the protection of convoys.³³

The arrival of Cansos from late 1941 onwards increased the range at which Eastern Air Command could carry out patrols and escort convoys. While some units to which Cansos were allocated, such as 5 (BR), received them as replacements for older, less

³² Douglas, The Creation of a National Air Force, 484; Milner, North Atlantic Run, 83; Hessler, The U-Boat War in the Atlantic, I, 89-92.

³³ Morison, The Battle of the Atlantic, 154, 248. Michael Gannon, Operation Drumbeat: the dramatic true story of Germany's first U-boat attacks along the American coast in World War II, (New York: Harper & Row, 1990), 380. Douglas, however, attributes both sinkings to Hudsons. Douglas, The Creation of a National Air Force, 489; Air Ministry, "The RAF in Maritime War," III, 21-22. Morison, The Battle of the Atlantic, 69, 101, 248. This system of escorts did not remain in force throughout the war. Unfortunately, Morison is rather unforthcoming about USN air activity from Argentia.

capable aircraft, others were formed especially to receive them. Among these new units was a detachment of 10 (BR), formed in response to increased sinkings to the south and west of Nova Scotia that began in early 1942. BdU had planned an offensive off the American coast when that country entered the war, but the Japanese attack on Pearl Harbor in December 1941 had caught the Germans unaware, and it took a few weeks to put together a small force of the longer-ranged Type IX U-boats for operations in North American waters. In mid-January 1942 the first group of five submarines arrived off the North American coast, where they operated with great success until mid-February. Second and third waves of submarines carried on operations in the same waters until the latter part of March. The *Cyclops* (9076 tons) was the first victim of the offensive in Canadian waters, sunk by *U-123* on 12 January. Although *U-123* continued on towards the American coast following the sinking, three U-boats remained in Canadian waters, and less than twenty-four hours later the attacks off Canada's coast began in earnest, when *U-130* sank the Norwegian *Frisco* and the Panamanian *Friar Rock* in the Cabot Strait. By the end of Operation *Paukensschlag*, (Drumbeat), as the offensive was called, forty-four ships had been sunk in Canadian waters, almost half of them during the first onslaught in January.³⁴

In the face of this offensive Eastern Air Command increased its forces, including those in Nova Scotia. Training aircraft were pressed into service, and new units were based in Yarmouth, close to the southern tip of the province. On 16 March, 10 (BR) was ordered to prepare a detachment to operate from this base under the command of F/L N.E. "Molly" Small, an experienced Canso pilot. The first two Canso 'A's for 10 (BR) Detachment, as it was officially designated, arrived in Yarmouth on 20 March 1942. By the 27th, the detachment had three aircraft on strength: Canso "A"s 9748, 9749, and 9750.

³⁴ Hadley, *U-Boats Against Canada*, 59-81; Douglas, *The Creation of a National Air Force*, 486-490. A figure of fifty-three ships sunk during this time is given in the British official history, but the figures for January and February agree with Hadley's statement that forty-four ships had been sunk "from January to March 1942". Hadley, *U-Boats Against Canada*, 79; Air Ministry, "The RAF in Maritime War," III, 72, n.3.

All three were not yet serviceable, however, and they were unarmed. The crews for the new aircraft also required training, and a nucleus of personnel were posted to the detachment from 5 (BR) and 116 (BR), squadrons already operating Catalinas or Cansos. On 30 March, while the detachment was still “working up”, it had its first encounter with the effects of the battle just off Canada’s shores when one of its Cansos homed a destroyer onto lifeboats from a torpedoed ship.³⁵

The locating of survivors was not an unusual occurrence for Eastern Air Command aircraft in the wake of Operation *Paukenschlag*. The command had flown 294 patrols in January, increasing to 332 in February and then 540 in March in the face of increasing U-boat activity. In addition to 10 (BR) Detachment 113 (BR) Squadron, operating Lockheed Hudsons, was also formed and assigned to Yarmouth. The 10 (BR) detachment began operations on 1 April, carrying out patrols and escorting convoys. By this time the main focus of the U-boat offensive off the North American coast had moved further to the south, with few boats operating north of Boston. Although sinkings in Canadian waters had decreased, single boats continued to operate off the Nova Scotia coast, searching for weak spots in the Canadian defences. Even though relatively few U-boats were operating in the waters off Nova Scotia, nine ships were sunk in Canadian waters during March and five more during April. As a result of these activities, Eastern Air Command’s available forces in Nova Scotia were fully committed to patrols and convoy escorts. The detachment’s

³⁵ Douglas, *The Creation of a National Air Force*, 490; Carl Vincent, “Prelude to Glory,” *High Flight*, 1:6, (November/December 1981), 230; “Intelligence Report - Week March 20-27th,” 2, DHist 181.003 (D307); “Secret Organizational Order No. 61 - Formation of No. 162 Squadron,” 17 April 1942, appended to 162 (BR) ORB, NAC RG 24, vol. C-12260; “The History of Eastern Air Command,” unpublished narrative [1945], 370, DHist 74/2, vol. 3. In March 1942 EAC was proposing to increase its BR strength by five squadrons due to the increased U-boat threat; one of the new units was to be based in Yarmouth. CAS to Minister for Air, “Air Defence of Canada,” 16 March 1942, DHist 181.005 (D2077). Unfortunately, it has not been possible to find the operational records of 10 (BR) Detachment. As a result, the detachment’s activities have been reconstructed from the weekly intelligence reports for RCAF Station Yarmouth. For a recent account of Operation *Paukenschlag*, see Gannon, *Operation Drumbeat*.

operations were described shortly thereafter in the weekly intelligence report for RCAF Station Yarmouth:

Weather permitting an A/S patrol was carried out daily, giving air protection to convoys proceeding to and from St John, New York, and Boston. There are three Canso A/C available for flying, two for training and one for operational flying, one of the two which are used for training may be used on operational work, but is not completely equipped for that purpose.³⁶

In addition to the shortage of aircraft, a problem that was to plague the unit for quite some time to come, there were other, unforeseen difficulties, including the rather ridiculous problem of attempting to fit Cansos entirely into the standard-sized hangars on the base, for which an ingenious solution was discovered.³⁷

Training continued apace, and the detachment's first contact with the enemy occurred before the end of the month, when F/L Small, the unit's commander, attacked a U-boat south-west of Yarmouth on 28 April. Small and his crew were carrying out a convoy patrol in Canso "A" 9749 when the conning tower of a U-boat was spotted about half a mile ahead and bearing 40° off the aircraft's port bow. The U-boat immediately began to submerge, and disappeared from sight a few seconds later. Small attacked, putting the Canso into a dive from an altitude of four or five hundred feet.³⁸ Fifteen

³⁶ Hadley, U-Boats Against Canada, 59. In addition to 10 (BR) Detachment and 113 (BR), Hudsons of No. 31 Operational Training Unit (OTU) and Fairey Swordfish of the Fleet Air Arm carried out patrols from Dartmouth, and Avro Ansons from No. 2 Air Navigation School in Pennfield Ridge, New Brunswick, also flew patrols. *ibid.*, 490; Air Ministry, "The RAF in Maritime War," III, 72; "Weekly Intelligence Report from RCAF Station, Yarmouth, N.S.," 1, 11-4-42 to 17-4-42, DHist 181.003 (D307).

³⁷ "It was found that a Canso A/C cannot enter the standard sized hangar in a normal position, as the tail-fin projects above the top of the hangar doors. By placing a low ramp in such a position that, the front landing wheel will ride up on the ramp, the tail-fin is depressed enough to allow clearance, thus the A/C can quite easily be placed inside the hangar. . . . This information may be useful to pass along." *ibid.*, 2.

³⁸ The identity of this U-boat is still apparently unknown. It had probably already sighted the aircraft and begun to submerge by the time that it was spotted from the Canso. Wing Commander C.L. Annis, in an analysis of maritime air operations written in early 1943, enumerated the Canso's deficiencies; among these was its large silhouette: "Royal Canadian Air Force operational records indicate very clearly that the aircraft offers a large silhouette for searching U-Boats' lookouts. Thus, the U-Boats dive early and combined with the Catalina's slow approach speed the aircraft is unable to get in an attack." C.L. Annis, "Submarine Warfare, World War II," January 29, 1943, 10, DHist 181.009 (D1151).

seconds elapsed before the aircraft, thundering along fifty feet above the ocean at 130 knots, approached the swirl left by the submarine's disappearance. Small began to move the quadrant that released the depth charges when the Canso was twenty-five yards short of the swirl. Only two of the aircraft's four depth charges dropped into the water, the first striking 125 feet ahead of the swirl, the second 100 feet further on. The 450-lb. Mk.VII depth charges, each containing 290 pounds of amatol, exploded some thirty feet below the surface. After the explosions subsided, Small and his crew saw no evidence on the surface of the water that would indicate damage to the U-boat, and soon returned to their convoy escort duties. Three and a half hours later, they returned to the scene of the attack and found a "patch of oil and bits of floating material . . . in [the] vicinity of attack." No trace of oil or debris was found by a ship arriving on the scene the following morning.³⁹

This attack, while an auspicious beginning for the detachment, did not sink the U-boat. It did, however, highlight some of the problems that EAC still faced in its anti-submarine campaigns as well as some of the progress already made towards resolving them. The first and most obvious problem was the failure of two of the four depth charges to drop during the attack. It was directly attributable to technical limitations in the aircraft itself, and probably indirectly caused by a lack of training on the new aircraft.⁴⁰ The

It is not entirely clear why Small was flying at such a low altitude while on this patrol. Normal procedure for EAC patrols at this time was to fly at an altitude of 1000 to 2000 feet. Small may have been flying low because of weather conditions, but this must remain a conjecture, as none of the documents concerning the attack provide information about cloud cover or any other aspect of the weather, despite spaces being made for such information on the forms. This may either be an omission, or a failure by aircrew to take post-attack debriefing and analysis seriously.

³⁹ John Campbell, *Naval Weapons of World War Two*. (London: Conway Maritime Press, 1985), 94, 89. The depth charges were naval weapons, modified for use by aircraft. The RAF had introduced them to replace the completely useless 100 and 250-lb. antisubmarine bombs of prewar vintage. They entered general service with Coastal Command in April and May of 1941. Air Ministry, "The RAF in Maritime War," II, app. IV, 380-381; "Form A.U.B. 1 - Report of U/Boat Sighting and attack by Aircraft," 28 April 1942, "Summary of R.C.A.F. Attack on U-boat," 25 February 1943, DHist 181.003 (D1131).

⁴⁰ In order to drop the depth charges, a lever was moved over electrical contact points on a quadrant. These in turn activated solenoids that operated the release mechanisms under the aircraft's wings. During this attack, the quadrant arm apparently went past the contact points so quickly that the solenoids were not activated. As a result, only the depth charges on the first and fourth position on the quadrant were dropped. Had the quadrant arm been swung at a slower

problem was noted in the reports made after the attack by the Intelligence Officer at Yarmouth, who stated that “It is considered that the attack was well carried out, and but for the fact that two of the four D.C.’s failed to release, probably would have been completely successful.”⁴¹ In truth, it cannot really be said if the attack would have been completely successful, but it would certainly have been more effective.

It is unusual that this problem did not manifest itself in training, especially during the squadron’s “working-up” period prior to beginning operations. If it had, and nothing had been done to rectify it, then an important problem had been ignored, which reflects poorly upon EAC’s attitude toward operations. Considering Small’s well-earned reputation as an ardent student of anti-submarine warfare, however, it is unlikely that this problem had occurred, for Small would certainly not have overlooked such a glaring defect in his squadron’s equipment. More likely the problem did not occur during training, but under the pressure of a combat situation Small moved the quadrant arm more quickly than during training, causing the malfunction.⁴²

There were other shortcomings in the attack and its follow-up. The aircraft did not stay in the vicinity of the attack for the remainder of its time on patrol; instead, it returned to the convoy and only revisited the site some three and a half hours later. Had the U-boat surfaced after the attack, the Canso would not have been there to attack again, or to call in other aircraft to help. Furthermore, no other aircraft appears to have been homed in to the site of the attack to search for the U-boat should it surface again. This was in keeping with current RCAF doctrine, under which searches for submarines were abandoned after losing

speed, all four depth charges might have been dropped. This problem was explained in a letter which, ironically, arrived at Yarmouth in time for Small to read on his return from this patrol. “Continuation of Form A.U.B. 1,” 29 April 1942. DHist 181.003 (D1131).

⁴¹ *ibid.*

⁴² Douglas describes Small as “Eastern Air Command’s outstanding pilot and its most conscientious student of maritime air power.” Douglas, The Creation of a National Air Force, 504. A study of his career in EAC would be a worthwhile undertaking. The problem of dropping depth charges with the correct spacing was later solved by the introduction of a bomb distributor, or intervalometer, which could be set to drop depth charges at various spacings provided the aircraft was flying at a constant speed.

contact. Coastal Command, however, often maintained searches after contact had been lost, and in about 25% of such cases a second sighting was made. None of the surface escorts from the convoy were called in to carry out an asdic search for the submarine, either, despite the fact that RCAF tactical doctrine at the time called for this procedure if a submarine had been spotted near a convoy.⁴³ It must be remembered, however, that Small was on convoy patrol, and so had other concerns besides remaining on the scene of the attack, namely the safe and timely arrival of merchant shipping. The attack had forced the submarine to submerge, reducing its mobility and ability to detect ships. As a result, Small had succeeded in protecting the convoy, which was, after all, the purpose of the patrol.

Shortly after this attack, the detachment witnessed the beginnings of what Michael Hadley has described as the U-boats' "spring attack phase" in Canadian waters as BdU followed up on the successes of Operation *Paukenschlag*. Two U-boats, *U-588* and *U-432*, carried out operations off the Nova Scotia throughout May, and other submarines were also active in the area.⁴⁴ On 17 May, Canso "A" 9750 was diverted from a patrol to investigate a DF bearing on a lifeboat from the 7127-ton British *Fort Qu'Appelle*, which had been sunk by *U-135*, at 39° 50' N 63° 20' W, but was unable to make contact. On the 19th, Canso "A" 9748 located the missing lifeboat at 40° 08' N 64° 12' W despite poor weather conditions, dropped emergency supplies to the survivors, and then guided HMCS

⁴³ W/C Robert Ripley to SASO, marginal note on "Weekly Intelligence report from RCAF Station, Yarmouth, NS, 9-5-42 to 15-5-42," 3, DHist 181.003 (D307). This intelligence report is interesting because it contains a memorandum, apparently from Small about the tactics to be adopted if a submarine submerged before an aircraft can carry out an attack. The abovementioned note is in response to Small's memorandum. The RCAF eventually adopted "Salmons", the hunting of submarines to exhaustion using a combination of air and sea forces, in July 1943. "Salmons" involved patrolling the area within which a submerged submarine might lie with aircraft to prevent its escaping on the surface while searching the area with ships using asdic (sonar) and radar. See Douglas, *The Creation of a National Air Force*, 569. It is also quite possible that no other aircraft were in the area and could be homed in, or even that other aircraft could not be homed in, due either to lack of training or lack of equipment. Additionally, there was a shortage of convoy escorts at this time, so it is quite possible that none could have been spared for such a search in any case. Hadley, *U-Boats Against Canada*, 79.

⁴⁴ *ibid.*, 82-84.

Melville to it.⁴⁵ Also on the 17th, 9748 used machine gun fire to get the attention of a schooner and have it pick up survivors of the 2117-ton Norwegian *Skotland*, sunk by *U-588* some sixty or seventy miles southwest of Yarmouth.⁴⁶ Later that same day, just before midnight, Canso "A" 9750 was sent to investigate a message picked up by the DF station at Rockville. The Free French freighter *Fort Binger* reported that it was being shelled by a submarine following an unsuccessful torpedo attack. Darkness and fog prevented the aircraft from making contact with the freighter or spotting the attacker, *U-588*, but flares were dropped in order to scare the latter away. This improvised tactic proved successful. While an unsuccessful search for the U-boat was carried out, weather closed down airfields in Nova Scotia, eventually forcing 9750 to land at Sydney after almost twenty-four hours in the air. The freighter and her injured crew, helped by the RCAF launch *Arresteur*, arrived in Yarmouth harbour the following day.⁴⁷

By the time the *Fort Binger* and the *Arresteur* completed their short voyage together, Number 10 (BR) Detachment was no more. Disbanded on 18 May, it was reformed as Number 162 (BR) Squadron the following day. During its brief existence the detachment had faced equipment and training problems, most if not all of which were shared with the other squadrons in Eastern Air Command. It had also encountered the

⁴⁵ "Weekly Intelligence Report from RCAF Station, Yarmouth, NS, 17-5-42 to 23-5-42," 1, DHist 181.003 (D307); Jürgen Rohwer, Axis Submarine Successes, 1939-1945, (Annapolis: United States Naval Institute Press, 1983), 96.

⁴⁶ "Weekly Intelligence Report from RCAF Station, Yarmouth, NS, 17-5-42 to 23-5-42," 1-2, DHist 181.003 (D307); Hadley, U-Boats Against Canada, 84. The Canso did not actually fire upon the schooner itself, but used the machine gun fire to attract the attention of the schooner when all other means of communication had failed. The use of machine guns as a means of ordering merchant vessels to stop was standard practice when visual and other signals had been ignored. The schooner appears to have ignored the standard means of requesting that fishing vessels and small craft alter course in a particular direction, which consisted of the aircraft flying low over the ship and heading in the desired direction and by firing a pyrotechnic light. "RCAF Manual of Anti-Submarine and General Reconnaissance Warfare, Vol. IV: Aircrew Handbook," March 1943, Section 1(h), "Signals for the Control of Merchant Vessels by Aircraft," DHist 181.009 (D1690).

⁴⁷ This attack triggered a full-scale search for *U-588*, although weather prevented any flying from Yarmouth from the 20th to the 24th. *U-588* was later sunk with all hands by HMCS *Wetaskiwin* and *Skeena* on 31 July 1942. "Weekly Intelligence Report from RCAF Station, Yarmouth, NS, 17-5-42 to 23-5-42," 1-3, DHist 181.003 (D307); Hadley, U-Boats Against Canada, 84.

consequences of the U-boat war off the Canadian coast, and had even made one inconclusive attack on the enemy. In the months and years ahead, the patterns of the war in the Atlantic were to change again and again, and 162 (BR), its personnel, and its aircraft would move from base to base as circumstances dictated, eventually travelling as far afield as Wick, Scotland. In the meantime, however, the squadron would stay in Eastern Canada, where the war at sea had changed once again, as *U-553* had entered the Gulf of St. Lawrence and had already made its first kills.

Chapter 2

Life Without Aircraft: May 1942 to March 1943

In future new members, on joining the Squadron, are requested to bring their own aircraft!

162 (BR) ORB, 10 December 1942.

The attacks witnessed by 162 (BR) off the Nova Scotia coast in May of 1942 were the result of a series of sorties against shipping in Canadian waters. While five of the seven ships lost in Canadian waters during this month were sunk off the coast, two were lost to U-boat attack in the Gulf of St. Lawrence. On 8 May 1942 *U-553*, commanded by Kapitänleutnant Karl Thurmann, entered the Gulf via the Cabot Strait. Four days later, north of the Gaspé coast, *U-553* sank the first ships in what would become known as the Battle of the St. Lawrence. The British steamer *Nicoya* sank after being hit by two torpedoes, while the Dutch steamer *Leto* went to the bottom just two hours later. The two waves of U-boats rolled through the St. Lawrence during the 1942 shipping season, sinking twenty-one ships without loss to themselves. In September, the Gulf was even closed to ocean shipping. Hard pressed in Atlantic waters, neither the Royal Canadian Navy nor the Royal Canadian Air Force could devote adequate resources to the campaign. If they had, the Atlantic lifeline would have been endangered.¹

Although Eastern Air Command devoted resources to operations in the Gulf of St. Lawrence, its patrols and escorts off the Canadian coast continued, and for the time being the new Canso squadron in Yarmouth, Number 162 (BR), was unaffected by the events in the St. Lawrence. In any case, the consequences of the U-boat offensive off Canadian shores were quite visible on 19 May 1942 as the RCAF launch *Arresteur* escorted the

¹ Great Britain, Air Ministry, Air Historical Branch, "The RAF in Maritime War, Volume III: The Atlantic and Home Waters - The Preparative Phase, July 1941 to February 1943," 72, DHist 79/599; Michael L. Hadley, U-Boats Against Canada: German Submarines in Canadian Waters, (Kingston: McGill-Queen's University Press, 1985), 84-87; 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), 493. For more complete discussions of the Battle of the St. Lawrence, see *ibid.*, 493-515, Hadley, U-Boats Against Canada, 82-143.

damaged freighter *Fort Binger*, fresh from her encounter with *U-588*, into Yarmouth harbour. The same day Flight Lieutenant Small, who was now the squadron's Officer Commanding (OC), made 162's first flight. It was a return trip to Moncton, carrying out a search along the way. Bad weather, ever the bane of Eastern Air Command, prevented further flying until the 25th, when two Cansos provided convoy coverage. Weather forced the early return of one of the aircraft, while the other flew a twelve and a half hour mission.² Compared with the previous week, the end of the month was quiet, although a sighting of an unidentified submerged object was made by a gunner on Canso 9750 on 30 May. While a squadron in name, 162 (BR) continued to exist at detachment level -- it had only 4 aircraft on strength, despite having an establishment of fifteen aircraft. It was also under strength with regards to personnel, having only twenty-two aircrew out of an establishment of 136 flying personnel, in addition to twenty-nine groundcrew. By the end of the month, the squadron, with fourteen officers, thirty-seven airmen, and four aircraft had carried out almost eighty hours of sweeps, fifty-four hours of convoy patrols, and slightly more than seven hours of practice flying and aircraft tests.³

Although available sources provide only limited information on the squadron's patrol areas, they can be inferred from specific references in operational records as well as from other sources. According to the RCAF's official history, 10 (BR) Detachment was originally formed in response to increased sinkings to the south and west of Nova Scotia, and one of the intelligence reports covering the detachment's operations described its patrol areas in early April as lying generally to the south of Yarmouth. Furthermore, during the period from April to June, inshore U-boat activity in Canadian waters was most intense to the south of Yarmouth, which would suggest that the unit's patrols would have been

² 162 (BR) ORB, 19, 25 May 1942.

³ The establishment was the officially set strength for a unit, setting it forth in considerable detail. "Weekly Intelligence Report from RCAF Station, Yarmouth, NS, 24-5-42 to 31-5-42," 1, DHist 181.003 (D307); 162 (BR) ORB, Summary for May 1942. No mention of this sighting is made in the squadron's ORB.

largely carried out in this area. These patrols were almost exclusively outer air sweep (OAS) patrols, which provided coverage at a distance from convoys, although diversions to search for the survivors of torpedoed merchant ships were all too common.⁴

June brought an increase in personnel, if not in aircraft. Forty-six airmen were taken on strength on 1 June, and the arrival of other personnel throughout the month brought the squadron to a total of 131 officers and men. The squadron took part in yet another search for survivors of a torpedoing on 2 June, when Canso "A" 9748 was diverted from an A/S sweep to search for the survivors of the 6919-ton British steamer *Mattawin*, which had been sunk that day by *U-553*. They were located by the Canso and then picked up by the Norwegian freighter *Torvanger*, which had been homed in on the lifeboats by the aircraft.⁵

A shortage of aircraft continued to pose a problem for the squadron; 9749 had left for Dartmouth on 10 June to undergo nosewheel repairs and was replaced by 9739 on loan from 5 (BR). Canso "A" 9748 suffered problems with its landing gear, both with nose wheel shimmy and with a brake seizure on landing that ruined the tire on the port wheel.⁶ Aircraft were also absent for other reasons. On 16 June, Cansos 9750 and 9746 left Yarmouth for Norfolk, Virginia to be fitted with radar, leaving 9739 and 9748 to carry out the squadron's duties. Both aircraft returned on 23 June, and six days later 9748 flew to Quonset, Rhode Island in order to receive a similar installation. The squadron underwent a

⁴ Douglas, The Creation of a National Air Force, 490; "Weekly Intelligence Report from RCAF Station, Yarmouth, NS, 1, 11-4-42 to 17-4-42," DHist 181.003 (D307); "The History of Eastern Air Command," unpublished narrative [1945], 370, 443, DHist 74/2, vol. 3, 4.

⁵ 162 (BR) ORB, June 1942; "Weekly Intelligence Report from RCAF Station Yarmouth, NS, 31-5-42 to 6-6-42," DHist 181.003 (D307), 1, Hadley, U-Boats Against Canada, 95, Rohwer, Axis Submarine Successes, 100.

⁶ *ibid.*, 10, 16, 17, 19 June 1942. The aircraft had previously experienced similar problems with its nose wheel, and this appears to have been a common problem with Catalina and Canso amphibians. The Consolidated Aircraft technical representative at Norfolk, Virginia, was well aware of this problem when some of 162 (BR)'s Cansos visited there to have radar installed. For details, see "Report Submitted by the Junior Intelligence Officer of Yarmouth Station on the Canso Trip to Norfolk, Virginia for installation of A.S.V.," supplement to "Weekly Intelligence Report for RCAF Station Yarmouth, NS, 26-7-42 to 31-7-42," DHist 181.003 (D307).

change of command on 29 June as F/L S.D. Turner assumed command of the squadron from S/L Small.⁷ The squadron carried out just over 272 hours of flying in June, 202 hours of which consisted of searches and convoy patrols. Bad weather, mostly fog, either prevented or interfered with operations on nine of thirty days in this month, and twice, on 11 and 19 June, it resulted in the diversion of returning aircraft to Greenwood, N.S. The remainder of the squadron's flying time consisted of practice, airframe and engine tests, "special equipment" (radar) tests, and ferrying aircraft to and from American bases for the installation of radar equipment.⁸

These installations of ASV Mark II radar were part of Eastern Air Command's modernisation of its maritime patrol forces. In comparison with other maritime air forces, and especially the Royal Air Force's Coastal Command, EAC was somewhat of a latecomer in providing ASV for its aircraft. By the middle of 1941, Coastal Command had installed ASV Mark II in approximately half of its 272 principal anti-submarine aircraft.⁹ The United States Army Air Force was somewhat slower in installing the equipment; by March of 1942, only four of its anti-submarine aircraft had been fitted with ASV, while the USN had installed ASV sets in three PBV-1s and two PBM-1s by mid-July of 1941.¹⁰ In the spring of 1941, a Digby of 10 (BR) had been fitted with this type of radar at the Test

⁷ *ibid.*, 16, 18, 29 June 1942. The squadron was notified of the change of command on 18 June, but Turner was absent on leave, which delayed the official change of command until the 29th. Small assumed command of 113 (BR), also based at Yarmouth.

⁸ *ibid.*, 11, 19 June 1942, Summary for June 1942.

⁹ Douglas, The Creation of a National Air Force, 475. By 30 June 1941, 127 of Coastal Command's 272 operational A/S aircraft had ASV Mark II installed, but only 73 of these were the full installation; the remainder had the short range "homing" aeriels only. Air Ministry, "The RAF in Maritime War," III, 44. See *ibid.*, 44 n. 2, for a breakdown of ASV fitment by aircraft type.

¹⁰ The USAAF's ASV problems were largely due to shortages of spares and new sets. Wesley Frank Craven and James Lea Cate, The Army Air Forces in World War II. Volume I: Plans and Early Operations, January 1939 to August 1942, (Chicago: University of Chicago Press, 1948), 527. Roscoe Creed, PBY: The Catalina Flying Boat, (Annapolis: Naval Institute Press, 1985), 50-51. Morison, as in some other areas of USN maritime patrol operations, provides no information about the installation of ASV Mark II in USN aircraft, although his second volume on the Battle of the Atlantic does provide information about 10 centimetre (microwave) ASV. Samuel Eliot Morison, History of United States Naval Operations in World War II: Volume X: The Atlantic Battle Won, May 1943-May 1945, (Boston: Little, Brown and Company, 1966), 52-53.

and Development Establishment at Rockliffe, where it had undergone trials during the summer and fall.¹¹ Shortcomings soon appeared in the equipment. Research Enterprises Limited had delivered 600 sets to the United States, and their unsatisfactory performance led to demands for modifications. These modifications were apparently successful, and modified sets were accepted by the RCAF in May 1942.¹² The installation of Canadian-built ASV in EAC aircraft began immediately thereafter. By the end of July most of the command's sixty-one Lockheed Hudsons had been fitted with ASV at Rockliffe by the end of July, but only four received the complete long range aerial set. The rest were fitted with the short-range forward-looking ASV installation only, which reduced the effective range of the radar.¹³ Pressures on the Rockliffe facility meant that EAC Canso flying boats and amphibians, including those from 162 (BR), were fitted with ASV at US Navy Air Stations in Quonset, Rhode Island, and Norfolk, Virginia. This assistance from the USN relieved some of the burden on the Rockliffe facility, although parts shortages meant that many installations were incomplete -- by the end of August only some ten Cansos had fully functional ASV sets. The creation of No. 1 RDF Maintenance Unit at Scoudouc, New Brunswick, apparently enabled EAC to complete the Canso installations.¹⁴

¹¹ Roger Sarty, "The RCAF's Eastern Air Command, ASV Radar, and Submarine Hunting," unpublished article, 1. The set used in this installation was likely one of the ASV sets that had arrived from Britain in January of 1941. Although Canada had recently undertaken the manufacture of ASV Mark II by Research Enterprises Limited (REL), a crown corporation founded for the production of precision instruments, prototypes of the radar were not ready until August and September of 1941. See J. de N. Kennedy, Canada in the Second World War: History of the Department of Munitions and Supply. (Ottawa: King's Printer, 1950), 423, 407, 429. ASV Mark II operated on a wavelength of 1.5 metres.

¹² Many of these modifications apparently concerned minor points of detail that had been conceded by the RCAF at the request of REL in order to simplify production. When they were rectified, the sets became acceptable. Sarty, "The RCAF's Eastern Air Command, ASV Radar, and Submarine Hunting," 1.

¹³ *ibid.*, 2. Like the RCAF, none of Coastal Command's Hudsons had the full installation, due to the difficulty of fitting the large long range aerals. Air Ministry, "The RAF in Maritime War," III, 44.

¹⁴ Sarty, "The RCAF's Eastern Air Command, ASV Radar, and Submarine Hunting," 1-2; 162 (BR) ORB, June 29, 1942. It is worth noting that although twenty-three of Coastal Command's thirty Catalinas were fitted with ASV Mark II by 30 June 1941, none of them had the complete long range set. Air Ministry, "The RAF in Maritime War," III, 44.

The junior Intelligence Officer from Yarmouth accompanied one of the aircraft on its trip to Norfolk, and reported that "our crews were much impressed with the general efficiency and speed

The full ASV Mark II installations on Cansos were distinctive and unmistakable. Long-range sideways looking aerials were installed on the fuselage, while short-range forward looking “homing” aerials were installed under the wings. These aerials were of the “Yagi” type, familiar postwar as television aerials. Initially, many of the prongs on these aerials were damaged or lost due to icing, which caused vibration and eventual breakage. This problem was solved by reinforcement of the aerial prongs, a modification completed on Cansos at Yarmouth by April of 1943. Despite their drawbacks, the Yagi antennas were used because parabolic and similar reflectors would have been too large for airborne use given the set’s wavelength of 1.5 metres.¹⁵ The range at which ASV could detect a surfaced submarine depended on a number of variables, including the altitude of the aircraft, the sea state, the submarine’s position (fully surfaced or trimmed down), and whether the aircraft was abeam of the submarine or not. The nominal ranges at which ASV Mark II had a “good chance” of detecting a surfaced submarine were given as 5 miles at 500 feet and 9 miles at 5000 feet for the forward-looking aerials, and 6 miles at 500 feet and 10 miles at 5000 feet for the sideways-looking aerials. If only the conning tower was

exhibited by the Repair Section in making the installation of our equipment. The work was well organised with ships [aircraft] passing through the various stages with all possible speed.” He also noted that the Consolidated Aircraft technical representative had found a solution to the problem the squadron’s aircraft were experiencing with nosewheel shimmy, which was apparently a widespread problem. This report provides an interesting example of a Canadian perspective on maritime air operations. The Intelligence and Meteorology sections at the latter are praised for a number of useful ideas, but the operational patrols and sweeps carried out by the Americans are criticised for their lack of range, duration, and planning. These criticisms are interesting in light of reports made by British officers evaluating maritime air operations in North America, and especially the report made by Commander P.B. Martineau, RN, in October 1942, which rated American organization and efforts more highly than those of Eastern Air Command. “Report Submitted by the Junior Intelligence Officer of Yarmouth Station on the Canso Trip to Norfolk, Virginia for Installation of A.S.V.”, Supplement to Yarmouth Weekly Intelligence Report for 26-7-42 to 31-7-42, DHist 181.003 (D307); Douglas, The Creation of a National Air Force, 522-526. RDF (Radio Direction Finding) was the original, British, term for radar, and was used in the RCAF until late in the war, when the American term radar (RADio Detection And Ranging) was adopted.

¹⁵ RCAF Station, Yarmouth, N.S. to AOCinC, EAC, “Operational General Report on REL ASV Mark II,” 30 April 1943, 2, DHist 181.009 (D4928) vol. 2; John S. Hall, ed., Radar Aids to Navigation, (New York: McGraw-Hill Book Company, 1947), 186. For a brief technical description of the Yagi antenna, see Massachusetts Insitute of Technology, Radar School, Principles of Radar, (New York: McGraw-Hill Book Company, 1946), 9-74-9-76

visible, the detection range was limited to some 40% of the maximum range. Submarine periscopes could not be detected at any useful range, and in rough seas, the range was reduced. The detection range for ships in the 600-1500 ton range was some 50% greater than that for a submarine, while detection ranges for convoys were twice as great.¹⁶ The minimum range of ASV was limited by “sea return”, caused by waves and which increased with the sea state and the altitude of the aircraft.¹⁷ The range at which a submarine could be detected was almost a moot point, since a Coastal Command inquiry in early 1942 had determined that faults in aerial design for the installations in Hudsons and Catalinas made ASV Mark II useless for submarine hunting. In actuality, none of the ASV contacts made by EAC aircraft in the summer and early fall of 1942 resulted in an attack. ASV was, however, an excellent navigational tool, both for locating coastlines and navigational beacons, as well as for locating convoys when flying escort missions, and this was an important consideration for the squadron’s operations from Yarmouth, with its frequent poor weather conditions.¹⁸

Such conditions were experienced as the fog that had interfered with 162 (BR)’s operations returned throughout July. An OAS patrol lasting almost seventeen hours was flown on 1 July, but fog prevented flying on the following five days. The squadron’s next

¹⁶ “Appendix B to Coastal Command Tactical Memorandum No. 23,” 9 December 1942, 4-5, National Archives of Canada, RG 24, series E1, vol. 5345, file H.Q.S.34-31-12, “ASV Mk II: Operation & Tactical Use of”.

¹⁷ “The Tactical Use of Airborne R.D.F.,” n.d., 2-3, National Archives of Canada, RG 24, series E1, vol. 5345, file H.Q.S.34-31-12, “ASV Mk II: Operation and Tactical Use of,”. As a general rule, radar cannot detect objects smaller than half its wavelength, which made detection of a target as small as a periscope with ASV Mark II highly unlikely. Max Schoenfeld, Stalking the U-boat: USAAF Offensive Antisubmarine Operations in World War II, (Washington: Smithsonian Institution Press, 1995), 183.

¹⁸ Sarty, “The RCAF’s Eastern Air Command, ASV Radar, and Submarine Hunting,” 6-7. ASV Mark II proved instrumental in 5 (BR)’s destruction of *U-209* on 4 May 1943, detecting the submarine at beyond visual range. Since 5 (BR) flew Cansos, and aerials on Cansos had been modified, as mentioned above, it is possible that the modified design was not only stronger but also more effective for detecting U-boats. Navigational beacons were receiver-transmitters that broadcast coded signals when triggered by ASV pulses. These signals were displayed on the screen of the ASV as a wide “blip” that displayed Morse code letters that differed from beacon to beacon followed by a long blip. These beacons proved very useful for navigational purposes.

attempt at a patrol, on 7 July, lasted only thirty minutes since the crew “accidentally dropped their load of depth charges over the coast.”¹⁹ The ORB entry for 14 July gives an idea of the conditions the squadron sometimes faced and the effect they had on operations:

F/O Tingle & crew with A/C 9740 went on an OAS and F/O Aldwinckle with A/C 9748 on a sweep. A bad storm developed later and 9748 with 7:55 hours in the air just beat it in and 9740 with 11:50 hours made a successful emergency landing at Greenwood. A severe electrical and rain storm continued during the night.²⁰

Weather prevented flying on the 19th and 20th, and prevented P/O Cousins and his crew from carrying out a sweep on the 23rd, despite two attempts that consumed over ten hours of flying time. Bad weather, though not necessarily in and around Yarmouth, interfered with flying during most of the month’s remaining days. Aircraft shortages also continued to dog the squadron, since Canso “A” 9749 was still in Dartmouth undergoing repairs. Canso “A” 9739, on loan from 5 (BR), was replaced on 1 July by 9740 and a crew from the same squadron.²¹ Canso 9748 returned from Quonset, Rhode Island, on 10 July with ASV Mark II installed, making for a total of three radar-equipped aircraft in the squadron. In order to maintain this new equipment a “special equipment,” or radar, section was established on 15 July. Three days later, it carried out the squadron’s first ASV test when P/O Tate, who is described as an “ASV instructor”, went up with F/L Turner and crew in Canso “A” 9750 for an ASV test and low level bombing practice.²²

¹⁹ 162 (BR) ORB, 7 July, 1942. It is interesting to note that the details of flights carried out state that the mission was not carried out because the radio was unserviceable, and not because of the loss of the depth charges.

²⁰ *ibid.*, 4 July 1942.

²¹ *ibid.*, 1, 11, 12, 19-31 July, 1942. This is not explicitly explained in the squadron’s ORB.

²² *ibid.*, 15, 18 July, 1942. This is one of several examples of lapses in security in the ORB; radar is also directly referred to in other entries. F/L Poag’s trip to Quonset, RI in May of 1943, for instruction on MAD (Magnetic Anomaly Detection) gear, described below, provides another example of such a lapse. Radar training for aircrew, by April of 1943, consisted of approximately ten hours’ instruction in general theory, operation, and tactical use of the equipment. This was supplemented by instructional films demonstrating operating theory. WAGs were given an additional ten hours of training in operation and making repairs in the air, after which regular lectures by the RDF (radar) officer kept them up to date. RCAF Station Yarmouth, NS, to AOC-in-C, EAC, “Operational General Report on REL ASV Mark II,” 30 April 1943, 4, DHist 181.009 (D4928), vol. 2.

Eastern Air Command's modernization efforts paid off on 31 July 1942, when S/L N.E. Small, who was by then the commander of the Yarmouth-based 113 (BR), scored EAC's first victory against a U-boat. Under Small's leadership the squadrons' Lockheed Hudsons had kept up to date with Coastal Command tactics, unlike many of EAC's squadrons. Among these innovations were the use of white camouflage for aircraft and patrols at altitudes from 3000 to 5000 feet, as opposed to the EAC standard of 1000 to 2000 feet.²³ The low-level patrols were easier for submariners to spot, and lookouts had come to expect them at those altitudes. Flying patrols at higher altitudes also increased the visibility for lookouts in the aircraft, with a corresponding increase in the likelihood of sighting a U-boat. These new tactics paid off south of Yarmouth on the 31st as Hudson 625, flying at 3000 feet, spotted *U-754* running on the surface some three miles ahead. Haze limited visibility to five miles and presumably impaired the effectiveness of the lookouts on the sub's bridge. The aircraft made its attack as the U-boat's crew members ran for the hatch, and it released its depth charges. They detonated near the submarine, which had barely begun to dive. Small continued to circle the site of the attack, and the front gunner opened fire on the submarine's conning tower when it briefly reappeared. Large air bubbles continued to appear until some 55 minutes after the attack, when a heavy underwater explosion was seen. Other aircraft relived the Hudson's patrol of the wreckage, and surface ships searching the area discovered large quantities of oil that indicated a sunken U-boat.²⁴

Small had been acting on fresh intelligence that had plotted the presence of a U-boat in the area; this was the result of an unofficial arrangement between Small and C.L. Annis at EAC HQ to pass on information to Yarmouth from the RCN's Operational Intelligence Centre (OIC), which was responsible for determining and promulgating these plots. The

²³ Douglas, The Creation of a National Air Force, 502.

²⁴ C.H. Waddington, O.R. in World War 2: Operational Research against the U-boat, (London: Paul Elek, 1973), 163-164, Douglas, The Creation of a National Air Force, 520, Hadley, U-Boats Against Canada, 109.

successful outcome of Small's attack, combined with other attacks made by 113 (BR) over the next few days, all of which were planned on the basis of DF bearings, led to the navy's daily estimates of U-boat locations being sent to EAC Headquarters in Halifax and No. 1 Group in Newfoundland so that other squadrons might take advantage of this information when planning their patrols.²⁵ It is interesting to compare this attack with Small's earlier encounter and with EAC's first attack, both of which have been described above. Aside from the effective use of intelligence, camouflage, and new patrol tactics, adopted from Coastal Command, Small also remained in the area until the end of his aircraft's endurance, calling in other aircraft to patrol the area after he was forced to leave, despite evidence of a kill, which, earlier in the war, might have suggested to EAC crews that such measures were unnecessary. Also, probably due to improved training and equipment, there had also been no technical malfunctions, like the hung-up depth charges Small had experienced in his earlier attack. In comparison with Annis' attack in October 1941, Small's success against *U-754* demonstrates the improvement in Eastern Air Command's anti-submarine capability by 1942.

August 1942, like the proceeding month, began with flying curtailed by weather. On the 3rd, the ORB noted the return of Canso 9749 from its long sojourn in Dartmouth "looking very glamorous in its new [white] camouflage!"²⁶ It was the first of the squadron's aircraft to sport the new scheme adopted by EAC, and it was yet another example of the Command's modernisation of its maritime patrol forces and its adoption of RAF Coastal Command practices and policies. Coastal Command's Operational Research Section, seeking to improve the effectiveness of its aircraft, had experimented with various

²⁵ "Interview with Air Marshal C.L. Annis covering his experiences in EAC and as Director of A/S Operations during WW II," 6-7, DHist Biographical File, "Annis, Clare Levi", Douglas, The Creation of a National Air Force, 520-521. For a brief history of the RCN's OIC, see W.A.B. Douglas and Jürgen Rohwer, "The Most Thankless Task' Revisited: Convoys, Escorts, and Radio Intelligence in the Western Atlantic, 1941-43," in The RCN in Retrospect, 1910-1968, James A. Boutilier, ed., (Vancouver: University of British Columbia Press, 1982), 221-224.

²⁶ 162 (BR) ORB, 3 August 1942.

camouflage schemes for reducing the visibility of anti-submarine aircraft, and had settled on white camouflage for the undersurface and sides of aircraft. This scheme was adopted for Coastal Command aircraft beginning in August of 1941.²⁷ Eastern Air Command was much slower to adopt the new camouflage scheme; as noted above, the first squadron to do so was 113 (BR), under the command of S/L N.E. Small in June 1942.²⁸ The success experienced by 113 (BR) when using the new camouflage and patrol tactics was demonstrated by the sinking of *U-754* on 31 July.

Two days after its arrival in Yarmouth, *Canso "A" 9749* left for Quonset, Rhode Island, for the installation of ASV. The absence of F/L Turner and his crew in this aircraft, and the granting of leave to another crew left the squadron with only two crews available for operations. On 7 August, while the "Duty" crew was flying convoy patrol and the "Available" crew had been released for the day, the squadron received a "sudden call" from Operations for an "immediate sortie". The crew was rounded up, and was on standby in *9748* until it was sent on a six-hour OAS patrol some four hours later.²⁹ This event seems

²⁷ Operational Research (OR) was introduced in the RAF early in the war and was adopted by other services and Allied countries. It consisted of the scientific analysis of operations in order to draw conclusions and present advice. OR played an important role in Coastal Command's development as an effective A/S force, as well as in the USN's A/S campaign. For a full description of the role of OR in Coastal Command's war effort, see Waddington, *O.R. in World War 2*. The genesis of the USN's organisation, the Antisubmarine Warfare Operational Research Group (ASWORG), is described in Montgomery C. Meigs, *Slide Rules and Submarines: American Scientists and Subsurface Warfare in World War II*, (Washington, DC: National Defense University Press, 1990), 58-63. For a brief description of OR in the Canadian military, see N.W. Norton, "A Brief History of the Development of Canadian Military Operational Research," *Operations Research: The Journal of the Operations Research Society of America*. 4:2, (April 1956), 187-192. The RCAF's Operational Research section was organized beginning in August 1942, and Eastern Air Command's section of this organization was set up in Halifax beginning in November 1942. Douglas, *The Creation of a National Air Force*, 523, 525-526. The Coastal Command camouflage order, issued on 10 August 1941, was the result of trials undertaken to determine the relative visibility of camouflage schemes. By the spring of 1942 all of Coastal Command's A/S aircraft carried the white camouflage. Great Britain, Air Ministry, Air Historical Branch, "The RAF in Maritime War, Volume II: The Atlantic and Home Waters - The Defensive Phase, September 1939 to June 1941," app. XII, 404-405. Douglas, *The Creation of a National Air Force*, 474-475. Waddington incorrectly gives the date as December of 1941. Waddington, *O.R. in World War 2*, 165.

²⁸ Douglas, *The Creation of a National Air Force*, 502.

²⁹ 162 (BR) ORB, 7 August 1942.

to have been the result of the previously mentioned telephone link between EAC HQ in Halifax and Yarmouth that played such an important role in Small's destruction of *U-754* on 31 July.

Weather continued to be a problem, with heavy fog often grounding aircraft. Between 8 and 24 August heavy fog curtailed flying on six days, and completely prevented it on seven. The squadron was beginning to work with its new radar equipment, both in training flights and on patrols, when "expert observers" were carried, presumably because the regular crews were not yet fully trained in its use.³⁰ August also witnessed a rather unusual non-aviation event. Between the 23rd and 26th many squadron personnel participated in what the squadron diary cryptically refers to as a "spy hunt", which was occasioned by a berry picker's encounter with three "foreigners" near Comeau's Hill, N.S. Perimeter patrols were organized for the airfield at Yarmouth in order to protect against any sabotage attempts, and a volunteer "Commando" squad of officers airmen was formed to deal with any such emergencies in the future. The unit was started up on 4 September and held its first field exercise on the 8th.³¹ On 24 and 25 August, the squadron participated in another search, this time for a missing Supermarine Walrus amphibian, with six Hudsons from 113 (BR) contributing to the efforts on the first day.³² On the 30th, yet another search was carried out, on this occasion for missing American Lockheed Hudsons, but the squadron diary is annoyingly silent about its results.³³ Despite poor weather, the squadron

³⁰ *ibid.*, 8-24 August 1942.

³¹ *ibid.*, 23-26 August 1942. The encounter and the ensuing search are described in the Yarmouth Intelligence reports for 15 to 21 and 22 to 28 August. There was no tangible result of the searches. "Weekly Intelligence Report for RCAF Station, Yarmouth, NS, 15-8-42 to 21-8-42,"; "Weekly Intelligence Report for RCAF Station, Yarmouth, NS, 22-8-42 to 28-8-42," DHist 181.003 (D307); "History of EAC," 435, DHist 74/2, vol. 3; 162 (BR) ORB, 4, 8 September 1942.

³² *ibid.*, 24-25 August 1942, "Weekly Intelligence Report for RCAF Station Yarmouth, NS, 22-8-42 to 28-8-42," 1, DHist 181.003 (D307). The radar-equipped Walrus, on detached service from the RN's Fleet Air Arm, was based at Sable Island from May to August of 1942, because of sightings and DF reports of submarines in the vicinity. It was forced to land in the ocean on 20 August. Its crew was rescued by ships of convoy HX 204 three days later, but the aircraft sank while under tow. Douglas, *The Creation of a National Air Force*, 520.

³³ 162 (BR) ORB, 30 August 1942. The flight is recorded as having taken four hours and ten minutes, yet is listed as having been completed. No information about the missing Hudsons is

made a total of eighty-two flights during August, for a total of four hundred and thirty-six hours and forty minutes of flying time. Operational flying occupied 287 hours; the remainder consisted of training, testing, and ferrying aircraft, including practice attacks on a submarine at Pictou, N.S.³⁴

The weather continued to interfere with the squadron's operations during the first few days of September. On 2 September, three of the squadron's pilots were ferried to 117 (BR) in Sydney, N.S., for three weeks' training in operations from the water, and three pilots were loaned to the squadron by 117 (BR) as replacements. The three pilots returned on the 29th. Water landing practice was also carried out by other crews later in the month.³⁵ Between 4 and 7 September, the squadron responded to yet another emergency off the Nova Scotia coast. Cover was provided for the burning American transport *Wakefield*, formerly the liner *Manhattan*, which survived the ordeal despite suffering tremendous damage. The ORB vaguely described this event as a "search for a U.S.A. vessel."³⁶ When the weather did allow flying, the squadron put forth considerable effort -- on 29 September, for example, three of the squadron's four aircraft were aloft, with two, 9746 and 9749, carrying out OAS patrols of fifteen hours each. The third, 9748, ferried

given in the ORB. A dinghy, apparently from one of the missing aircraft, was found by fishermen on 10 September. "Weekly Intelligence Report for RCAF Station, Yarmouth, NS, 11-9-42 to 17-9-42," 3, DHist 181.003 (D307).

³⁴ 162 (BR) ORB, 26 August 1942, Summary, August 1942. The submarine used for practice attacks was undoubtedly the same British submarine with which a Hudson from 113(BR) carried out exercises on 19 August. "Weekly Intelligence Report for RCAF Station Yarmouth, NS, 15-8-42 to 21-8-42," 2, DHist 181.003 (D307).

³⁵ *ibid.*, 2, 4, 8, 9, 29 September 1942. Since there was a proper seaplane base at North Sydney, as opposed to the airbase separate from the harbour at Yarmouth, the aircrew were undoubtedly able to carry out more complete training. 117 (BR) was equipped with both Catalina flying boats and Canso "A" amphibians. Samuel Kostenuk and John Griffin, RCAF Squadron Histories and Aircraft, 1924-1968, (Toronto: Samuel Stevens Hakkert&Company, 1977), 50.

³⁶ The squadron had been providing cover for *Wakefield's* convoy, TA 18, which was returning from Britain, the day before the outbreak of the fire. The events surrounding the fire and salvage of the *Wakefield* are recounted in Samuel Eliot Morison, History of United States Naval Operations in World War II: Volume I: The Battle of the Atlantic, (Boston: Little, Brown and Company, 1966), 327-329, and Farley Mowat, The Grey Seas Under, (Toronto: McClelland & Stewart, 1958), 271-276. It is interesting to note that there is a considerable discrepancy between the two accounts.

pilots back from 117 (BR) at North Sydney, and then carried out practice water landings.³⁷ Even when the weather co-operated, however, other factors could prevent the successful completion of missions. On 8 September, Canso "A" 9748 flew a twelve hour OAS that was not successfully completed because the convoy could not be located.³⁸ September also witnessed the departure of six of 113 (BR)'s aircraft for Mont Joli, in response to the increased U-boat activity in the Gulf of St. Lawrence. In the space of two weeks, *U-165* and *U-517* had sunk eleven ships in the Gulf. To complicate matters, a British request for Canadian escort vessels for the landings in North Africa (Operation "Torch") had resulted in a Canadian government decision to close the St. Lawrence to ocean-going shipping in order to free up the requested ships. Even after the removal of ocean shipping from the St. Lawrence, however, convoys were still necessary for the shipping that supported coastal trade and major industries in the area. With the Royal Canadian Navy's meagre supply of escorts even further diminished by Operation "Torch", much of the responsibility for convoy protection fell upon the RCAF. At one point, a temporary relocation of all Yarmouth-based aircraft to bases on the Gulf was suggested, but in the end only 113 (BR) was relocated, with 162 remaining in Nova Scotia. USAAC aircraft, flying from Westover Field, Massachusetts, assumed responsibility for 113 (BR)'s patrols in the Yarmouth area beginning on 18 September.³⁹

³⁷ 162 (BR) ORB, 29 September 1942. The fourth aircraft, 9750, does not appear to have flown after 3 September, but the ORB makes no mention of its being unserviceable. The aircraft next appears on 3 October, and the entry for the following day mentions that a .50 calibre gun installed in the nose of the aircraft was tested. It may have been elsewhere receiving this installation, but the ORB makes no mention of this. It is also curious that a .50 calibre and not a .303 calibre weapon was installed.

³⁸ *ibid.*, 8 September 1942

³⁹ "Weekly Intelligence Report for RCAF Station, Yarmouth, NS, 11-9-42 to 17-9-42," 3, DHist 181.003 (D307); Douglas, The Creation of a National Air Force, 501-506; Hadley, U-Boats Against Canada, 112-131. The RCN contributed a total of seventeen corvettes to Operation "Torch"; six were involved in the initial landings, while others were used as additional transatlantic escorts. Marc Milner, North Atlantic Run: The Royal Canadian Navy and the Battle for the Convoys, (Toronto: University of Toronto Press, 1985; Markham: Penguin Books, 1990), 168-169.

October brought more activity for 162 (BR) on a number of fronts. In the first week, ten officers were promoted, including F/L Turner, the squadron's OC, whose promotion to Acting Squadron Leader was confirmed on the 7th. The squadron received a further boost to its effective strength when Canso "A" 9750, unmentioned in the squadron's records for a month, reappeared on 3 and 4 October.⁴⁰ The sinking of the Finnish merchant ship *Carolus* by *U-69* near Mont Joli on 9 October, coupled with DF bearings and intelligence that indicated the presence of submarines in the St. Lawrence river and off of Gaspé, probably led to the dispatching of two of the squadron's aircraft to Mont Joli. Canso "A" 9750 left Yarmouth on 10 October and Canso "A" 9749 followed the next day. The attack had taken place only 173 miles from Quebec City and was the deepest penetration of the St. Lawrence by a U-boat up to that time.⁴¹ Although recommendations to deploy 162 to the Gulf to reinforce 113 (BR)'s Hudsons had been made prior to this date, the coverage of ocean convoys off of Nova Scotia, 162 (BR)'s status as EAC's only long-range squadron at Yarmouth, and the squadron's limited operational capabilities due to its shortage of aircraft probably prevented such a reallocation of forces until October. Long-range aircraft such as the squadron's Cansos were of far more use providing coverage for oceanic shipping than over the more confined waters of the St. Lawrence, where faster, shorter-ranged aircraft such as 113 (BR)'s Hudsons were more useful for protecting trade and attacking U-boats.⁴² With only four aircraft at Yarmouth, the withdrawal of any of the unit's Cansos for use in the St. Lawrence would have reduced the already limited coverage that 162 (BR) could provide for shipping in the Atlantic.

⁴⁰ 162 (BR) ORB, 1-7 October 1942.

⁴¹ Douglas, The Creation of a National Air Force, 505-506; Hadley, U-Boats Against Canada, 132.

⁴² Douglas, The Creation of a National Air Force, 504; Kostenuk and Griffin, RCAF Squadrons and Aircraft, 46. Unfortunately, the microfilm version of the ORB for Mont Joli appears to be incomplete, and the ORB for 162 (BR) makes no mention of the operations by 9749 and 9750 during their detached service there.

The departure of 9749 and 9750 for Mont Joli left the squadron with only one serviceable aircraft, Canso "A" 9746, after 11 October. The fourth aircraft, according to a note in squadron records, was unserviceable for the entire month.⁴³ Aircraft 9746 was apparently unserviceable from 2 to 14 October, which prevented any operational flying from Yarmouth. The weekly intelligence report for the station at this time noted that

The morale of all personnel remains at a high level despite the enforced inactivity of aircrews. It is regrettable that sufficient aircraft are not available to provide a minimum flying schedule. The crews attached to 162 (BR) and 113 (BR) Squadrons are becoming restless due to this inactivity . . .⁴⁴

American aircraft, as had already been arranged, were replacing 113 (BR)'s absent Hudsons. Four B-25s arrived in Yarmouth on 12 October, leaving the following day to provide air cover for the troopship *Queen Mary* and her escort. The Hudson Training Unit, established at Yarmouth to train pilots for Hudson aircraft, provided coverage for the Saint John - Digby ferry *Princess Helene* that had formerly been provided by 113 (BR).⁴⁵ Despite their posting to Mont Joli, 162 (BR)'s aircraft continued to rely on Yarmouth for servicing. Canso "A" 9749, which had left for Mont Joli on 11 October, returned to Yarmouth for servicing on the 15th, and flew back to Mont Joli the following day, while Canso "A" 9750 flew to Yarmouth on 19 October for servicing, returning to Mont Joli on 21 October.⁴⁶ On the 17th, 9746, along with a pilot, was transferred to the Hudson Training Unit, also based at Yarmouth, for instructional purposes. This effectively put an end to 162's operations from Yarmouth until the 28th, when Canso "A" 9749, which had returned from Mont Joli on the 24th but had been prevented from flying by bad weather, flew a fourteen hour OAS. On 30 October 9750 returned from Mont Joli, and preparations

⁴³ Note in 162 (BR) ORB, October 1942.

⁴⁴ "Weekly Intelligence Report, RCAF Station, Yarmouth, NS, 9-10-42 to 15-10-42," 2, DHist 181.003 (D307).

⁴⁵ *ibid.*, 1-2; "The History of Eastern Air Command," unpublished narrative [1945], 587, DHist 74/2, vol. 3. The Hudson Training Unit also gave training courses on other aircraft.

⁴⁶ 162 (BR) ORB, 15-21 October 1942.

were made to return it to the Gulf with a new crew, but problems with the aircraft prevented this flight until 2 November.⁴⁷

Although the detachment of the squadron's aircraft to Mont Joli, the transfer of another to the Hudson Training Unit, and the unserviceability of a fourth prevented much operational flying from Yarmouth, the personnel on the base were occupied with other duties. In addition to the drill practice and ground training routine already mentioned, pilots were given time in the Link Trainer, Wireless Air Gunners were given instruction in the use of ASV, and the hangar and attached facilities were given thorough cleanings. Preparations were in hand for a move to a larger hangar at Yarmouth, although the move did not take place until 20 November, when the squadron moved to No. 5 and 6 Hangars on the RAF side of the base. There were also rumours that the squadron was to receive another aircraft, which appeared to be confirmed by F/O Tingle's departure by train to Western Air Command to pick up a Canso, although Tingle reappears in the squadron diary in November without aircraft and without any explanation of his absence or return.⁴⁸

Ground training continued throughout October, and a new schedule of thirty-two lecture periods per week was implemented towards the end of the month. In addition to the regular lectures and training, aircrew from both 162 (BR) and 113 (BR) met with the Station Intelligence Officer on a weekly basis to discuss "subjects on operational intelligence".⁴⁹ In addition to the ground routines involving lectures and training, maintenance and general clean-up work around the base occupied members of the squadron when flying was not possible. A morning physical training (PT) class had been instituted in August, and trap shooting, instruction in use of the Aldis Lamp for signalling, and practice for inter-unit rugby also kept the squadron's personnel busy on such days. Touch

⁴⁷ *ibid.*, 17 October - 2 November 1942.

⁴⁸ *ibid.*, 1-14 October, 15, 20 November 1942.

⁴⁹ "Weekly Intelligence Report, RCAF Station Yarmouth, NS, 23-10-42 to 29-10-42," 2, DHist 181.003 (D307). Observers training with the Hudson Training Unit were also given instruction by the Station Intelligence Officer.

Rugby appears to have been foremost among the sports that occupied the squadron at this time of year. On 29 October, the squadron's airmen defeated the officers 13-3, and on the 31st, the squadron's team defeated Central Maintenance and won the Station Cup. Social life was not neglected either. On 24 October, the station's officers entertained the officers of the local army unit, while the 30th witnessed a "highly successful" Halloween dance at which the squadron was "well represented as usual."⁵⁰ The squadron was involved in the selling of War Bonds and the Victory Loan; on 17 October the unit's "Commando" group, which had been organised to defend the base following the "spy hunt" in late August, took part in an "impressive tattoo on the village green in aid of the sale of War Bonds . . . a realistic and blood-curdling action, the whole spectacle being illuminated by searchlights and bursting shot and shell!"⁵¹

November in Yarmouth began with yet another shortage of aircraft. On 2 November Canso "A" 9750 left for the detachment at Mont Joli after a short flight to test the aircraft and a recently installed nose gun, leaving the squadron in Yarmouth with only one serviceable aircraft, Canso 9748. On 5 November, the squadron was denied even the services of this aircraft when, as the ORB stated, "Hardworking 9748 . . . is now due for a long rest in the lush pastures of Central Maintenance."⁵² The squadron was now left with one serviceable aircraft, 9750, and it was at Mont Joli. This Canso carried out two convoy patrols over the St. Lawrence on the 7th and 9th, for a total of just under twenty-four hours' flying, before returning to Yarmouth on November 11. In the absence of aircraft,

⁵⁰ 162 (BR) ORB, 6,9,10 August 1942, Summary for September 1942, 24-31 October 1942.

⁵¹ The Victory Loan campaign managed to raise some \$8,800 dollars by 25 October. *ibid.*, 17, 25 October 1942. The demonstration took the form of a mock attack on AA gun positions, and the unit drilled heavily before the demonstration. "Weekly Intelligence Report, RCAF Station Yarmouth, NS, 9-10-42 to 15-10-42," 2, DHist 181.003 (D307). The "Commando" group had been organized in early September after reports of foreigners near Comeau's Hill, NS, led to a "spy hunt" and fears of sabotage at the airfield. In addition to these volunteers, all personnel at the station underwent defensive training courses. "The History of Eastern Air Command," unpublished narrative [1945], 435, 500, DHist 74/2, vol. 3.

⁵² Canso 9749 was apparently unserviceable at this time. 162 (BR) ORB, 2, 5 November 1942.

the usual ground routine of training, sports, and lectures prevailed. Almost certainly as the result of the squadron's enforced inactivity and the resultant availability of its aircrew for ferrying duties, S/L Turner and a "skeleton crew" left Yarmouth for Montreal "by bus, rail & boat" on 7 November to pick up and deliver a Catalina to 116 (BR).⁵³ The lack of aircraft was keenly felt by the squadron, as is evidenced in its diary, where the refrain of "No flying -- no aircraft!" appears in the first days of November. In upcoming months, this was to become a familiar entry.

On Remembrance Day, Canso "A" 9750 with F/O MacBride and crew returned to Yarmouth from Mont Joli for servicing. It was unavailable for operations until the 14th, when it was taken on a short patrol by MacBride. Canso "A" 9750 was to fly patrols on the following two days, but was occupied with practice bombing flights on the 17th. The same day, 9749 returned to service, being used for local training. Operational flying and training with the two aircraft continued until 20 November, when the squadron moved to No. 5 and 6 Hangars on the "bleak heights" of the RAF side of the airfield. Flying training resumed the following day, with thirteen hours of dual instruction of second pilots as well as bombing practice taking place. The squadron was settling into its new facilities, but the diary noted that

... all remaining personnel are finding (and being found) plenty of work in adapting stores, offices, lecture rooms, etc. to our particular needs. Due to the vast size and cathedral like atmosphere of the hangars, communications becomes somewhat of a problem. Re-arrangement of telephones, and the orderly room bicycle, plus large notice boards all help in this problem.⁵⁴

Operational and local training flights continued until the end of the month, and although weather did force the recall of aircraft on patrol, flying was actually prevented on only three days when aircraft were available for flying, a marked improvement over previous months. The end of the month witnessed a temporary reduction in the squadron's strength on two fronts. On 28 November S/L Turner ferried Canso 9748 to Dartmouth for major repairs,

⁵³ *ibid.*, 2-11 November 1942.

⁵⁴ *ibid.*, 11-22 November 1942.

despite the aircraft having been grounded since 5 November for servicing. Semi-annual leave was also granted to crews beginning 24 November, and by the end of the month two crews were on leave, with a third leaving in early December and others departing later in the month.⁵⁵

The weather began to close in at the beginning of December. The diary entry for 3 December noted that “High winds rising to gale force continue – also cold and searching!”⁵⁶ Although the storm lessened on following days, it continued to affect flying, which was described as “very rough”. On 9 December, Canso “A” 9750 was sent on a sweep for a missing US Coast Guard cutter, which was not located. Operational flying came to a temporary halt the following day, when the weather closed in again. Two new pilots, F/L Beer and F/L Poag were posted to the squadron on the 10th, which led the squadron diary to note, somewhat sarcastically, that “In future new members, on joining the Squadron, are requested to bring their own aircraft!”⁵⁷ The following day, Canso “A” 9749 participated in a successful twelve-hour search for the Soviet submarine *L-15* and its American destroyer escort. Bad weather and a lack of serviceable aircraft prevented much more operational flying. The ORB entry for the 17th summarized the situation, stating simply that “the less said the better about the weather, profanity being inadmissible in official documents!”⁵⁸

⁵⁵ *ibid.*, 28, 24, 31 November 1942, 3, 21-24 December 1942.

⁵⁶ *ibid.*, 3 December 1942.

⁵⁷ *ibid.*, 4-6 December 1942; “Weekly Intelligence Report, RCAF Station, Yarmouth, NS, 4-12-42 to 10-12-42,” 1, DHist 181.003 (D307); 162 (BR) ORB, 10 December 1942. Poag later became the squadron’s OC.

⁵⁸ Weekly Intelligence Report, RCAF Station, Yarmouth, NS, 4-12-42 to 10-12-42, DHist 181.003 (D307). This is recorded only as a “search for allied submarines” in the squadron’s ORB. The presence of Soviet submarines with American escorts off the Canadian coast was part of the movement of twelve submarines from the Soviets’ Pacific Fleet to their Northern Fleet via the Panama Canal. This search was undertaken while the submarines were en route from the Panama Canal to Halifax, and suffering heavily due to bad weather. I. Kolyskin, Submarines in Arctic Waters, (Moscow: Progress Publishers, 1966), 183-186, Jan Breemer, Soviet Submarines: Design, Development and Tactics, (Coulsdon: Jane’s, 1989), 74; 162 (BR) ORB, 11, 17 December 1942.

The squadron's relative tranquillity was shattered on Christmas Eve, when it received an urgent message from Eastern Air Command, ordering two Cansos and three crews to Gander, Newfoundland, immediately. The onset of winter had brought an end to flying boat operations from Newfoundland, forcing 116 (BR)'s flying boats to move south from Botwood to Dartmouth, Nova Scotia. Winter weather had also driven 117 (BR) from its base at Sydney. The withdrawal of 10 (BR)'s aging Digbys from Gander to Dartmouth and their replacement by the Canso "A"s of 5 (BR) had left No. 1 Group with only one squadron of Cansos at Gander and 145 (BR)'s Hudsons at Torbay with which to provide coverage for Atlantic convoys. As a result, 162 (BR) was called upon to reinforce the inadequate forces at Gander.⁵⁹ Since 9750 was unserviceable, the squadron reclaimed 9746 from the Hudson Training Unit and chose its three crews, but bad weather prevented their departure until 27 December, when the two aircraft flew as far as Sydney. Canso "A" 9746 arrived in Gander on 2 January, but icy conditions caused it to overshoot the runway, damaging its undercarriage, hull, and port wing, although F/O Tingle and his crew were uninjured.⁶⁰ Unfortunately, it has not proved possible to reconstruct the squadron's operations from Gander, as both the squadron ORB and relevant records from Gander provide no information relating specifically to the detachment's activities. The departure of the two aircraft for Gander, the continued unserviceability of Canso "A" 9750, and 9748's absence in Dartmouth for major repairs left 162 (BR) with no aircraft for operations from Yarmouth. On 28 December, S/L Turner, the squadron's OC, took some leave, part of which would be spent "in visiting some service pals in Ottawa - Object: 'Some gen on our desperate A/C situation!'"⁶¹

The squadron's ORB entries for the subsequent eleven days in Yarmouth are rather bare, since no activities aside from the normal ground routine of lectures and training could

⁵⁹ Douglas, The Creation of a National Air Force, 531-532.

⁶⁰ 162 (BR) ORB, 24-27 December 1942; RCAF Station Gander, Newfoundland ORB, 2 January 1943, NAC RG 24, C-12186.

⁶¹ 162 (BR) ORB, 28 December 1942.

take place due to the lack of aircraft and the absence of three of the squadron's crews. "There is only one wish for the New Year", the squadron diary recorded, "AIRCRAFT."⁶² January 8 brought bad news to the squadron, both in Yarmouth and from Gander. In the afternoon, a Hudson of 113 (BR) crashed and burned a few miles from the airfield at Yarmouth. The pilot, P/O Voglesang, a former member of 162 (BR), and the four crew were all killed. Shortly thereafter, a report arrived from Gander that Canso "A" 9737 of 5 (BR), piloted by S/L N.E. Small, OC of 113 (BR), and crewed by 162 (BR) personnel, was missing. Confirmation soon arrived that the aircraft had crashed shortly after takeoff from Gander airport early the previous morning and that S/L Small, the former commander of 162 (BR), F/O A.M. Tingle, F/Sgt. J.T. Mangan, F/Sgt. D.L. Hudson, and Sgt. H.E. White, all of 162 (BR), had been killed in the crash. F/Sgt. J.E. Banning and Sgt. W.H. Wilson, also of 162 (BR), survived the crash and were not badly hurt. "It is impossible to express our feelings with regard to these two calamities", the diary states, "the loss of so many of our good Comrades has stunned the whole station."⁶³ On 24 January the squadron held a Memorial Church Parade with a service at the Central United Baptist Church in memory of the squadron members who died in the crash at Gander.⁶⁴

This accident was largely the result of Eastern Air Command's efforts to increase the effective range of its aircraft. In an attempt to reach the areas of the "air gap" in the middle of the Atlantic where losses to U-boats were heaviest, EAC was pushing its Cansos to the limits of their endurance, since the VLR Liberators that would have closed the gap were not yet available to the RCAF. Squadron Leader Small had arrived in Gander on 4 January, partly to lecture aircrew on A/S warfare, but mainly to attempt to increase the operational range of 5 (BR)'s Cansos, a subject which he discussed with the squadron's

⁶² *ibid.*, 1 January 1943.

⁶³ *ibid.*, 8 January 1943, RCAF Station Gander, Newfoundland ORB, 7-8 January 1943. In one of the many strange coincidences of war, it is interesting to note that the commander of *U-132*, which operated in the St. Lawrence during July 1942 was also named Vogelsang. Hadley, *U-Boats Against Canada*, 100-110.

⁶⁴ 162 (BR) ORB, 24 January 1943.

crews. Small's flight on the 7th was an attempt to carry out a patrol as far east as 38°W, or approximately 700 miles from base. Patrols with Cansos from Gander normally extended only as far as 45°W, or approximately 550 miles from base.⁶⁵ Small, according to an interview with A/M C.L. Annis,

was just beginning this demonstration of how to maximize endurance of aircraft and they took off fully loaded of course, flying south across Gander Lake where there was quite an incline and it produced down-drafts. . . . They were climbing away after dark, both looking down obviously at the compass which was between their feet, and flew into the mountain, or the hill . . .⁶⁶

The official history, however, attributes the crash to equipment failure. Small's efforts had not been in vain, though; 5 (BR)'s Cansos, stripped of their extra weight in much the same manner as Small's, were able to operate out to about 650 or 700 miles, at which distance in February they made four sightings of U-boats, all of which were attacked with inconclusive results. The real solution to EAC's problem, however, was the provision of VLR Liberators to Eastern Air Command, which would not take place until later in 1943.⁶⁷

⁶⁵ The most dangerous part of the air gap was between 35° and 50° west. In this area, convoys SC 104 and SC 107 had suffered heavy losses. Douglas, The Creation of a National Air Force, 532. The increase in range was made possible by a reduction of 1200 lbs in overall weight, which was to be used to carry more fuel. Machine guns, ammunition, some emergency rations, and other items of equipment were removed. Gander ORB, 4-6 January 1943, "Weekly Intelligence Report from RCAF Station Gander Newfoundland, 2-1-43 to 8-1-43," 2, DHist 181.003 (D264). Unfortunately the appendix to the intelligence report describing Small's discussion with the aircrews does not appear to have survived. Annis stated that using Cansos and Digbys, EAC was only able to provide consistent convoy coverage out to 45°W. Beyond that point, "consistent results have been disappointing." C.L. Annis, "Submarine Warfare, World War II," 9, 29 January 1943, DHist 181.003 (D309). At a range of 550 miles, a normally-equipped Canso "A" was able to provide only four hours of convoy coverage. HQ EAC to RCAF Ottawa, signal A.439, 29 November 1942, NAC RG 24, vol. 5177, file H.Q.S.15-1-350 vol. 1, "Convoy Protection".

⁶⁶ "Interview with Air Marshal Clare L. Annis", 2-3, 10 September 1979, DHist Biographical File. The Air Ministry in London had asked the RCAF in late November about the possibility of extending its convoy coverage from Newfoundland using Canso "A"s to a range of 600 miles or more. See NAC RG 24, vol. 5177, file H.Q.S.15-1-350 vol. 1, "Convoy Protection" for correspondence on this subject.

⁶⁷ Douglas, The Creation of a National Air Force, 541-545; Air Ministry, "The RAF in Maritime War," III, 542-543. For a discussion of the provision of Liberators for the RCAF, see Douglas, The Creation of a National Air Force, 522-523, 537-567.

On 9 January, S/L Turner returned from leave, apparently without news of new aircraft for the squadron. Canso "A" 9750 also returned to the air that day, escorting some Tiger Moths to Newfoundland. Despite the lack of aircraft, the squadron's ground routine continued as usual, and new personnel continued to arrive. The squadron diary noted that

R86912 LAC Sanderson W.C. . . . is posted to us from #1 "Y" Depot - he wears an Air Gunner's badge. We have a gun for him, in fact several perfectly good guns - but the airborne mounting is another matter.⁶⁸

The weekly intelligence report for the station also commented on the lack of aircraft for the squadron, reporting that

It will be noted . . . that 162 (BR) Squadron has done no operational flying during the past week [8 to 14 January]. This condition has persisted for over a month due to the fact that the squadron has no available a/c. As a result the five crews attached to this squadron have done on the average less than twenty hours flying, over a period of two months. This situation, if continued, will lead to dissatisfaction and unrest, signs of which are already becoming apparent. This is unfortunate since the personnel of this squadron has had up to the present time a very high standard of discipline and morale. In addition to lack of a/c, the recent flying accidents have had an adverse effect on this squadron, which could be readily overcome by getting the air crews into the air again.⁶⁹

On 18 January, the squadron received a call from EAC asking for a WAG and two Flight Engineers to be sent to Vancouver "immediately if not sooner". The three caught a ride to Dartmouth in a Hudson of the Hudson Training Unit based at Yarmouth as the first stage of their trip.⁷⁰ The following day two navigators left the squadron on loan to 10 (BR) at Dartmouth, and news was received of an impending visit by the Deputy Inspector General (DIG), so the entire squadron was put to work cleaning up the hangars, offices, and other facilities. The DIG did not arrive on 20 January, mainly due to the seventy mile per hour gale and the ice remaining from the previous day's frozen sleet.⁷¹ At about this time the Adjutant, F/L F.G. Ibbett, who was responsible for maintaining the squadron's diary,

⁶⁸ 162 (BR) ORB, 11 January 1943.

⁶⁹ "Weekly Intelligence Report, RCAF Station, Yarmouth, NS, 8 Jan. 43 to 14 Jan. 43," DHist 181.003 (D268), 2.

⁷⁰ 162 (BR) ORB, 18 January 1943.

⁷¹ *ibid.*, 19-20 January 1943.

received news of a posting to Orlando, Florida, for a Fighter Control course. He noted, perhaps with some sarcasm, that the posting would end “a most pleasant and instructive Chapter of Service life – this Unit and the Station will be hard to duplicate.”⁷² Some of the squadron’s inactive pilots were pressed into service ferrying aircraft; on 30 January, three of them left for Dartmouth to pick up three Fairey Swordfish aircraft for the Naval TAG (Telegraphist Air Gunner) School at Yarmouth.⁷³ January ended uneventfully – the squadron diary described the 31st as

The last day of a dull month -- no flying whatsoever -- no aircraft. We do not hear from the three N.C.O.’s we sent to Vancouver as part of a ferrying crew -- perhaps one day, the red carpet with suitable trimmings will be unrolled for the reception of a Canso.⁷⁴

They would not have long to wait.

The beginning of the end of the squadron’s aircraft drought appeared to be at hand when F/O R.H. Cousins and crew left for Dartmouth to pick up Canso 9765 on 4 February. Fog and rain prevented their return until the 6th, when the diary noted that

This is the first aircraft the Squadron have had for some time, and there was a noticeable uplift in the Spirit and Moral [sic] of all personnel at the prospect of flying again. The new aircraft disappeared into Maintenance for an acceptance check, and minor repairs. It is anticipated it will be unserviceable for approximately one week.⁷⁵

The squadron was again pressed into service ferrying aircraft on 10 February, when F/L H.A. Beer left for Moncton to ferry an aircraft back to Yarmouth and to attend a Court Martial at Greenwood, returning to Yarmouth two days later. The same day, S/L Turner left for Halifax “to arrange some important Squadron details at Command.” On 13 February the squadron diary noted that “all Units [are] flying with the exception of 162. We are still waiting to get our aircraft away from Central Maintenance.” S/L Turner

⁷² *ibid.*, 28 January 1943.

⁷³ *ibid.*, 30 January 1943. The training establishment had been set up in January. For details of its origins and history, see the DHist PRF file on Yarmouth, 5-6.

⁷⁴ 162 (BR) ORB, 31 January 1943.

⁷⁵ *ibid.*, 6 February 1943.

returned from Halifax the same day, looking “quite pleased” with the results of his trip to EAC. The poor weather and lack of operational aircraft at Yarmouth confined 162 (BR) to its usual ground routine, including athletics. On 15 February, the squadron volleyball team beat the Stores and A/C Section 59-2, and won again the following evening, this time 45-5 against the RDF section. “It would appear”, noted the squadron diary, “that having no aircraft is definitely improving the Volley ball played by all Squadron personnel.”⁷⁶

Yet again on 17 February the squadron was pressed into service ferrying aircraft, both for itself and for others. F/L R.M. Aldwinckle and crew left by train for Montreal to pick up a Canso for the squadron from Canadian Vickers, while F/L H.A. Beer, F/L R.E. MacBride, and P/O W.F. Robinson were flown to Amherst, N.S., to ferry three Avro Ansons back to Yarmouth, and S/L S.D. Turner and crew left by air for Dartmouth to ferry a Canso to 5 (BR) at Gander. Beer, MacBride, and Robinson returned to Yarmouth the following day S/L Turner and crew delivered Canso “A” 9763 from Dartmouth to Gander, returning on 22 February. In view of the expected arrival of another aircraft, and presumably in expectation of a renewal of training and operational flying, plans were underway to give all personnel who had not had a forty-eight hour pass so far in February to receive one for the upcoming weekend, since it was expected that flying would resume the following week.⁷⁷

The hopes of the squadron for new aircraft were crushed on 20 February when a report was received that F/L R.M. Aldwinckle and crew in the Canso “A” they had picked up in Montreal had landed in Dartmouth and that they were to take it to Gander instead of Yarmouth. Canso “A” 9765 was moved into the squadron’s hangars that same afternoon, but it had only been relocated to make room for other aircraft at Central Maintenance – the squadron would be responsible for completing its repairs. The squadron also received four new WAGs, while two RDF personnel were sent to New York to be trained on a new type

⁷⁶ *ibid.*, 10-16 February 1943.

⁷⁷ *ibid.*, 17-19, 22 February 1943.

of equipment, probably centimetric radar.⁷⁸ The next few days witnessed the return of one of the squadron's original aircraft, however. Canso 9749 left Gander on 24 February, but weather forced a landing at Dartmouth, and the flight was completed the following day. In an unusual event, two stowaways were found on board the aircraft after it left Gander. They were left behind in Dartmouth. Ferrying continued to be on the agenda in February. On the 26th, F/O W.F. Robinson ferried an Anson from Yarmouth to Halifax, while the following day, arrangements were made for the squadron to ferry three Curtis Seagulls from New York to No. 1 NAG (Naval Air Gunnery) School in Yarmouth. The pilots left on 1 March, and two aircraft were brought back a week later; the third was damaged in a ground loop. Canso 9749 also returned from Central Maintenance on the 27th, and made the first flight in "many moons" from Yarmouth on 28 February when nine and a half hours of flying training were carried out.⁷⁹

At the end of February 1943, 162 (BR) seemed to be destined for a career of ferrying aircraft for other units while waiting for Cansos that never arrived. Although its limited number of Cansos had been updated with radar and effective white camouflage, unserviceable aircraft and operational commitments in the St. Lawrence meant that the personnel in Yarmouth were often left without aircraft and without apparent purpose in the war. The squadron's shortage of aircraft would finally be eliminated in the near future, as more Cansos rolled off the production lines and the Canadian authorities prepared for a repeat of the 1942 St. Lawrence campaign on a larger scale. In a cruel twist of fate, however, other aspects of EAC's modernization would leave 162 (BR) without the aircrew to operate their new aircraft.

⁷⁸ Canso "A" 9765 was awaiting the delivery of a new control column. *ibid.*, 20, 23 February 1943. The training in New York was probably on ASG, an American-built 10 cm radar. Canadian personnel had begun attending these radar training courses early in 1943. Sarty, "The RCAF's Eastern Air Command, ASV Radar, and Submarine Hunting," 13.

⁷⁹ 162 (BR) ORB, 22-28 February 1943, 1, 8 March 1943. No. 1 NAG School had been set up in late November and early December of 1942 to train air gunners for the Royal Navy's Fleet Air Arm. "Fact Sheet, East Camp, RCAF Station Yarmouth, Nova Scotia, 1942-45," DHist R/Y/ Yarmouth, 1-2.

Chapter 3

Life Without Aircrew! April to September 1943

“with the loss of fourteen aircrew . . . this Squadron ceases to become Operational . . .”

162 (BR) Operations Record Book, 13 April 1943.

March of 1943 witnessed the long-awaited build-up of 162 (BR)'s aircraft strength to squadron level, but almost immediately afterwards the long-suffering squadron found itself deprived of aircrew in order to build up 10 (BR), which was just beginning to receive the first of the RCAF's urgently required and long awaited VLR Liberators. By this time the RCAF was also beginning to receive large numbers of the Canso "A"s that it had ordered from Boeing Canada in Vancouver and Canadian Vickers in Montreal. Furthermore, in the wake of the "Battle of the St. Lawrence" in 1942 Canadian authorities anticipated a major inshore U-boat offensive in Canadian waters in 1943, and the buildup of 162 (BR)'s strength was a logical preparation for the anticipated onslaught. "After months of inactivity," the weekly intelligence report for Yarmouth noted,

162 (BR) Squadron is receiving aircraft and crews are being checked out ready for operational work. Due to many postings from this Squadron, much training will be required to build new crews. Two aircraft are being used at present for training purposes. Other Cansos are on route [sic] to the Squadron.¹

¹ W.E. Scarborough, PBY Catalina in action, (Carrollton: Squadron/Signal Publications, 1983), 50; "Weekly Intelligence Report, RCAF Station, Yarmouth, NS, 26 Feb. 1943 to 4 March 1943," 2, DHist 181.003 (D268). Many sources, including the RCAF's official history, do not give production rates and delivery dates for Cansos built in Canada. Wartime documents, however, indicate that Canso deliveries were to begin in earnest in early 1943, and that in April of that year delivery rates averaged fifteen a month. "North American Supply Committee. Statistics; Canadian Production Schedules," 10 July 1942 - 1 October 1943, PRO AVIA 38/1029; "Position of Outstanding Aircraft Contracts (as at [sic] 6-4-43)," DHist 181.005 (D2077).

In March 1943 the Chief of the Air Staff stated that "it will be necessary to concentrate our maximum effort on anti-submarine warfare off the Atlantic Coast and in the Gulf and River St. Lawrence to assist the Royal Canadian Navy in reducing and nullifying enemy U-boat activities in these areas." CAS to Minister of National Defence for Air, "Air Defence of Canada Plan, 1943-44," 20 March 1943, DHist 181.005 (D2077). See Marc Milner, The U-Boat Hunters: The Royal Canadian Navy and the Offensive against Germany's Submarines, (Toronto: University of Toronto Press, 1994), 33-37 for an account of Canadian preparations for the anticipated inshore campaign.

Throughout March crews left Yarmouth and collected Cansos to ferry back to the base. On the 4th, a crew left for Montreal to collect a Canso for the squadron. Four days later S/L Turner ferried two crews to Moncton to pick up two Cansos, and Canso "A" 9766 was ferried to Yarmouth from Dartmouth. These new arrivals brought the squadron's strength to an unprecedented six aircraft. The following day, Canso "A" 9808 arrived from Montreal, and on the 9th two crews left for Ottawa to collect two more aircraft. The first of these, 9754, landed in Yarmouth on 13 March. The next day, Canso "A" 9770 arrived from Montreal, bringing the squadron strength to a total of eight aircraft. On 16 March, another crew left for Montreal to ferry yet another Canso to Yarmouth.²

The squadron carried out its first operational flight in months from Yarmouth on 18 March 1943, and the ORB noted that "The moral [sic] of the whole Squadron has noticeably improved at the prospect of renewed Operational Duties."³ Operations carried on after this new beginning, and on 21 March another Canso "A", 9809, flew in from Montreal, giving the squadron a total of nine aircraft on strength. The same day, two more crews were ferried to Ottawa to pick up two more Cansos for 162 (BR), while on the 22nd, Canso "A" 9755 arrived from Ottawa, with 9767 following the next day.⁴

The squadron's expansion was not without its problems; on 24 March all Boeing-built Cansos with serial numbers between 9751 and 9770 were grounded due to their gas tanks having been painted with the wrong kind of paint, a problem that took some 350 man-hours to rectify.⁵ The ORB recorded that

It is interesting to note that the aircrew do not regard the aircraft put out by Boeing very highly, as they seem to be always going unserviceable from minor causes and

² 162 (BR) ORB, 4-16 March, 1943.

³ *ibid.*, 18 March 1943.

⁴ *ibid.*, 21-23 March 1943. The 23rd also witnessed another Hudson crash at Yarmouth, when a Hudson of 113 (BR) crashed on takeoff, killing its crew and two members of the crash rescue crew who died when the aircraft's depth charges were set off by the fire. 113 (BR) ORB, 23 March 1943.

⁵ Memorandum from OC 5 (BR), "Defects Discovered During Acceptance Checks of Canadian Built Canso "A" Aircraft," 1, 28 April 1943, NAC RG 24, vol. 4969, file H.Q. 606-38HK, vol. 1, "Aircraft: Consolidated PBY, Contracts for Supply of".

arrive in a very bad condition with the paint chipped off all over the hull. On the other hand Vicker's [sic] aircraft are considered very good.⁶

On 26 March, Canso "A" 9808 was sent to Dartmouth to pick up spare parts and paint remover to fix the gas tanks on the unserviceable aircraft. The problems with the Boeing-built Cansos and the other new arrivals meant that on the following day, when veteran Canso "A" 9749 was sent to Maintenance for its fifty hour check, none of the squadron's eleven aircraft were available for patrols. Advantage was taken of this situation to hold a smoker, which the squadron diary described as "a huge success, with the Beer flowing freely", although the following morning "everyone was on the job bright and early although not to [sic] bright themselves after the hectic Smoker the night before." Operations resumed on 29 March with Canso 9749 flying a fifteen and a half hour OAS, and intensive training flights also began as repairs were made to the new aircraft.⁷

April began with flying training, especially pilot qualification and bombing practice, using the new aircraft. This was mandated by the fact that as of 1 April, only one of the squadron's Cansos was fully serviceable for operational activities, with the remainder being incompletely equipped.⁸ The squadron was in need of spares and maintenance equipment for the recent arrivals, and on 5 April Canso "A" 9749 was flown to Moncton to procure the necessary materials. On 11 April two crews were flown to Ottawa to ferry back more aircraft for the unit, and the ORB noted that "this is the first day

⁶ 162 (BR) ORB, 23 March, 1943. This attitude was shared by 5 (BR) in Gander, which stated that "This Unit has presently received seven Aircraft off the Boeing Contract and one off the Canadian Vickers Contract. The Boeing built aircraft have been the most unsatisfactory to date." Memorandum from OC 5 (BR), "Defects Discovered During Acceptance Checks of Canadian Built Canso "A" Aircraft," 1, 28 April 1943, NAC RG 24, vol. 4969, file H.Q.606-38HK, vol. 1, "Aircraft: Consolidated PBY, Contracts for Supply of"

⁷ 162 (BR) ORB, 26-28 March 1943.

⁸ "Weekly Intelligence Report, RCAF Station, Yarmouth, NS, 26 March to 1 April 1943," 3, DHist 181.003 (D268). Other squadrons experienced similar problems with newly-delivered Cansos being incompletely equipped. Boeing-built Cansos delivered to 5 (BR) in Gander arrived without bomb distributor or selector switch boxes installed, as well as suffering from numerous mechanical defects. See memorandum from Officer Commanding 5 (BR), "Defects Discovered During Acceptance Checks of Canadian Built Canso "A" Aircraft," 28 April 1943, NAC RG 24, vol. 4969, file HQ. 606-38HK, vol. 1, "Aircraft: Consolidated PBY, Contracts for Supply of". Additional correspondence on the problems experienced with Boeing-built Canso "A"s can be found in this file.

in the history of the Squadron that there are more aircraft than Pilots.”⁹ In a cruel twist of fate, events on the following day would leave the squadron with far more aircraft than pilots. Cansos “A” 9810 and 9772 arrived in Yarmouth that day, bringing the squadron’s strength to twelve aircraft, but the squadron also received an urgent request from EAC to supply crews for 10 (BR), which was in the process of re-equipping with Consolidated B-24 Liberators. Fourteen aircrew, including two aircraft captains, were chosen by drawing names from a hat, which left the squadron with only three complete crews, all of whom would be required for training new personnel.¹⁰ The ORB noted the following day that

with the loss of fourteen aircrew as outlined on April 12th, this Squadron ceases to become Operational and until such time as our new Personnel arrive it would appear we will operate as a Ferry Squadron and continue Training. Four crews leaving tomorrow morning for Ottawa to ferry four Canso “A” aircraft to Moncton for # 5 B.R. Squadron.¹¹

The new status as a ferry squadron was not appreciated by the unit’s remaining personnel. The ORB noted a few days after the above entry that “this Squadron is now known as ‘The Ferry Squadron’ and all Squadron Personnel are showing a definite lack of interest at spending the next few months on ferry work and Training.”¹²

Despite the lack of crews to fly them, more aircraft continued to arrive in Yarmouth. On 16 April, Canso “A” 9759 arrived from Ottawa, and 9779 arrived two days later. Training occupied the squadron until 23 April, when reports of submarines put three Cansos in the air on anti-submarine sweeps. Another aircraft was up on an A/S sweep the following day, but the squadron’s reputation as “the Ferry Squadron” was reinforced by

⁹ 162 (BR) ORB, 1-11 March 1943.

¹⁰ *ibid.*, 12 March 1943. Although the ORB states that the crews were ferried to Ottawa to pick up the aircraft, it also states that the aircraft were ferried in from Montreal. A/M C.L. Annis, who was at that time Officer Commanding 10 (BR), stated in an interview that he received “carte blanche” from EAC to select personnel from other squadrons to build up the RCAF’s first VLR squadron as quickly as possible. “Interview with Air Marshal Clare L. Annis,” 9-13, 10 September 1979, DHist Biographical File. See 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), 522-3, 537-551 for a discussion of the RCAF’s efforts to obtain VLR Liberators.

¹¹ 162 (BR) ORB, 13 April 1943.

¹² *ibid.*, 16 April 1943.

the transporting of a crew to Montreal to ferry a Canso to Dartmouth. Training and limited operational patrols, as well as collecting for the Victory Loan Drive, occupied 162 (BR) for the remainder of the month. The weekly station intelligence report noted towards the end of April that "162 (BR) has sufficient a/c but is occupied with training new crews. However, it is operational in a limited sense."¹³

The squadron itself also faced the possibility of relocation. Plans to provide air cover for shipping in the St. Lawrence for the 1943 shipping season had been under discussion for some time, and these discussions included 162 (BR). Part of the new disposition of forces intended to counter the anticipated inshore U-boat campaign included the deployment of detachments of a Canso "A" squadron to Gaspé, Mont Joli, and Seven Islands. Initially, the choice appears to have been 161 (BR), which had not yet been formed, but a letter from A/V/M G.O. Johnson, AOC-in-C EAC to Ottawa on 20 March observed that

it does not seem possible that it can be formed and efficiently operational in time for the beginning of the critical period - i.e., the beginning of May. The squadron will be further handicapped by being split up into three detachments before it has had a chance to operate as a unit.¹⁴

Johnson also suggested that Cansos were unsuitable for Gulf patrols due to their slow speed and "inability to strike quickly from shore bases at reported submarines."¹⁵ A reply from the CAS to Johnson overrode this concern, and refers to the deployment of 162 (BR), presumably taking the place of 161 (BR), to the Gulf for the first time, as well as

¹³ *ibid.*, 17-30 April 1943, "Weekly Intelligence Report, RCAF Station, Yarmouth, NS, April 16/43 to April 22/43," 3, DHist 181.003 (D268). On 27 April, the Hudson Training Unit, which had operated from Yarmouth alongside 162 (BR,) was disbanded and its aircrew posted to Dartmouth. "Weekly Intelligence Report for RCAF Station, Yarmouth, NS, 23 April to 29 April 1943," 3, DHist 181.003 (D268).

¹⁴ AOC EAC to Secretary, DND for Air, 20 March 1943, DHist 181.004 (D54). It should be noted that Air Force Headquarters in Ottawa and EAC Headquarters did not agree on the disposition of forces. Douglas, The Creation of a National Air Force, 510. For an account of Canadian concerns about an inshore U-boat campaign in Canadian waters, see Milner, The U-Boat Hunters, 33-37.

¹⁵ AOC EAC to Secretary, DND for Air, 20 March 1943, DHist 181.004 (D54).

mentioning the advisability of posting personnel who had gained operational experience in the Gulf during 1942 to the squadron in order to increase its effectiveness.¹⁶ A preliminary outline of squadron dispositions, dated 16 April, proposed the deployment of 162 (BR) detachments to Gaspé, Mont Joli, and Seven Islands. The squadron would be replaced at Yarmouth by the as yet unformed 161 (BR).¹⁷ When Eastern Air Command began to distribute forces within the Gulf at the end of April and the beginning of May, however, 162 (BR) remained in Yarmouth. The squadron's need to train new crews as a result of the influx of new aircraft and the loss of aircrew to 10 (BR) in April, meant that it was not ready to deploy to the St. Lawrence, despite Air Force Headquarters' desire that they be transferred there. Furthermore, 160 (BR), which was intended to take over 162 (BR)'s responsibilities at Yarmouth, was not able to do so until September of 1943. By then, the need for aircraft to reinforce the ocean convoys was greater, and the planned redeployment to the Gulf never took place.¹⁸

May began with news of another move within the station. The squadron was to occupy hangars on the west side of the station which were being vacated by 113 (BR), with the move taking place on 12 May.¹⁹ The squadron's shortage of flying personnel caused by the re-equipping of 10 (BR) with Liberators continued to affect those left in Yarmouth, as was demonstrated by the problems facing the unit's Flight Engineers. Although all of them were fully qualified for promotion, none could be promoted because they had not taken the appropriate course. Unfortunately, due to the lack of operational

¹⁶ CAS to AOC-in-C EAC, 5 April 1943, DHist 181.004 (D54).

¹⁷ Memorandum from SASO, "Gulf Operations - 1943," 16 April 1943, DHist 181.002 (D151). In actuality, 161 (BR), which was formed on 28 April at Dartmouth, remained there until May of 1944, when it was transferred to Gaspé. Number 160 (BR), which was formed at Sea Island, BC, replaced 162 (BR) at Yarmouth, beginning in July of 1943. Samuel Kostenuk and John Griffin, RCAF Squadron Histories and Aircraft, 1924-1968, (Toronto: Samuel Stevens Hakkert & Company, 1977), 67.

¹⁸ Douglas, The Creation of a National Air Force, 510, 514-515.

¹⁹ 162 (BR) ORB, 2, 12 May 1943. 113 (BR) had recently been re-equipped with Lockheed Venturas and was moving to Sydney. Kostenuk and Griffin, RCAF Squadrons and Aircraft, 46.

personnel, none of the flight engineers in question could be spared for these courses and hence could not be promoted.²⁰

New personnel began arriving to replace those lost to 10 (BR) as operational and training flights continued throughout the month. The squadron was also being exposed to advances in anti-submarine warfare. On 9 May F/L Poag was flown to Quonset, Rhode Island, for a special course on "Secret Equipment", in this case the Magnetic Anomaly Detector, a method of detecting submerged submarines.²¹ Aircraft unserviceability also continued to plague the squadron. The ORB entry for 14 May noted that

S/L S.D. Turner and crew in Canso "A" departed for Halifax with W/C M.G. Doyle as passenger. The Officer Commanding practically blew a fuse in getting away to Halifax. He tried two other aircraft which were supposed to be serviceable before finally getting away in Canso "A" 9810.²²

On 15 and 16 May a search was carried out for a missing Hudson from Debert, N.S., apparently without success. Probably as a result of the ice clearing from the St. Lawrence, Canso "A" 9770 was sent on an A/S sweep in the Gulf of St. Lawrence on 16 May,

²⁰ 162 (BR) ORB, 1 May 1943.

²¹ *ibid.*, 1-9 May, 9 June 1943. While the ORB avoids describing the nature of Poag's training in the May entries, on 9 June it openly states that "S/L W.F. Poag left by air today for Ottawa on temporary duty to discuss with the Staff there on his recent instruction on M.A.D.E. [sic] Equipment." This is an interesting, most likely unintentional, lapse in security. MAD detected the distortion in the earth's magnetic field caused by the presence of a submarine's steel hull. Originally a British idea, the USN had been developing MAD at Quonset Point for quite some time; its first successful detection of a "tame" submarine was made by a MAD-equipped Catalina in October of 1941. By March 1942, the Mark IV version of the device demonstrated a detection range of 500 feet against a "tame" sub, and some 240 of them had been ordered by the American services. Great Britain, Air Ministry, Air Historical Branch, "The RAF in Maritime War, Volume IV: The Atlantic and Home Waters - The Offensive Phase," app. V, 1-3; Roscoe Creed, PBY: The Catalina Flying Boat, (Annapolis, Md; US Naval Institute Press, 1985), 50-51; Montgomery C. Meigs, Slide Rules and Submarines: American Scientists and Subsurface Warfare in World War II, (Washington, DC: National Defense University Press, 1990), 54-55. It is not clear why Poag was chosen to go to Quonset. It may simply have been because 162 (BR) was the closest RCAF maritime air squadron to Quonset, and that they were equipped with Cansos, the Canadian version of the American Catalinas that were being used to develop MAD equipment. His subsequent trip to Ottawa to brief the Air Staff on MAD equipment suggests that he may have been the only EAC officer to take the course at this time.

²² 162 (BR) ORB, 14 May 1943.

carrying out patrols on the 18th and 19th, and returning to Yarmouth on the latter day.²³ As training progressed, the squadron was able to make more operational flights, weather permitting. On 29 May, Canso "A" 9749, while providing coverage for convoy ON 184, helped reunite the corvette HMCS *Arrowhead*, which had wandered some 40 miles away, with the convoy. The end of the month witnessed a mercy flight; on the 31st, an airman, who had been seriously injured in an unexplained "brawl with several soldiers" was flown to Dartmouth for treatment.²⁴

June saw the squadron's operational flying continue to recover from the loss of aircrew in March. Only 134 operational flying hours had been logged in March out of a total of 369 spent in the air. April flying hours had totalled just under 500, of which slightly more than half were operational. The squadron had only been able to carry out 340 hours of operational flying out of a total of 610 hours in May. Over 660 hours of operational flying, 339 hours of training, and testing and ferrying in June brought the squadron's total flying hours to 1033, a considerable increase over the previous month.²⁵ With its return to operations and the departure of 113 (BR) for Sydney, 162 (BR) had taken over much of the responsibility for local operations that had once been carried out by the other squadron's Hudsons, in addition to covering convoys out over the Atlantic. Among the squadron's new responsibilities was the protection of local shipping, particularly the *Princess Helene*, the ferry operating between St. John and Digby. The ORB entry for 11 June noted that "the patrol of the 'Princess Helene' from Digby to Saint

²³ *ibid.*, 16-19 May 1943, "Weekly Intelligence Report - RCAF Station, Yarmouth, NS, 14 May to 20 May 1943," 1, DHist 181.003 (D268); Douglas, The Creation of a National Air Force, 514. The ORB mistakenly states that the flight was made by Canso 9720; this is probably a typographical error. Breakup of ice in the St. Lawrence occurred more quickly than had been expected, and EAC was rushing to get its forces in place. A detachment of three Cansos and a Catalina from 117 (BR) was established at Gaspé between 18-21 May, and by the end of the month the squadron was based at Gaspé and North Sydney. The Canso "A" from 162 (BR) was probably dispatched to the Gulf to provide temporary reinforcement while 117 (BR) established itself in its summer bases. *ibid.*

²⁴ *ibid.*, 15-31 May 1943. "Weekly Intelligence Report - RCAF Station, Yarmouth, NS, 28 May to 3 June 1943," 1, DHist 181.003 (D268).

²⁵ 162 (BR) ORB, summaries for March to June 1943.

John is being carried out with monotonous regularity and is commonly known as the 'Milk Run'."²⁶ The squadron continued to provide escorts for shipping off the Nova Scotia coast, and its efforts did not go unnoticed; the station intelligence report for 18 to 24 June noted that

R.C. Naval authorities have recently praised highly the good escort work being done by 162 BR Squadron, especially for the manner in which the Captains of the aircraft have communicated with the Senior Naval Officers aboard escorts, and the close co-operation with escorts and vessels in the convoys.²⁷

The ships escorted by the squadron's Cansos, however, were not always so helpful. On 18 July Cansos 9769 and 9779 were escorting troop convoy AT 54A, and they reported "a singular lack of co-operation on the part of the convoy in exchange of signals." The training of new personnel was continued on as the squadron carried out its operational commitments. One of the more spectacular portions of the training programme occurred on 12 June all aircrew were taken out to sea to witness a practice attack on some sea markers. The ORB recorded that

On a pre-arranged signal from the boat, the aircraft dived to the attack and came in low with front gun firing and dropped a stick of four depth charges and marked the spot with a series of smoke floats. The first concussion was felt in the bottom of the boat followed by the dull thud of the explosions as the water rose to a height of at least 100 feet. . . . After the attack the M.T.B. with all the aircrew proceeded to secure all the fish killed by the concussion - after filling a life raft with fish the aircrew expressed themselves in no uncertain terms that it was a very educational and enjoyable afternoon.²⁸

²⁶ *ibid.*, 11 June 1943. The *Princess Helene* was built specifically for service on the Digby-Saint John run, and could carry 500 passengers and 50 automobiles. She entered service in 1930 and was retired in 1963. Concern for the ferry's safety was particularly acute during the months after the ferry *Caribou* had been sunk in the Cabot Strait by *U-69* with heavy loss of life. Harry Bruce, *Lifeline: The Story of the Atlantic Ferries and Coastal Boats*, (Toronto: Macmillan, 1977), 242; "A History of Eastern Air Command," unpublished narrative [1945], 500, DHist 74/2, vol. 3; Michael L. Hadley, *U-Boats Against Canada: German Submarines in Canadian Waters*, (Kingston: McGill-Queen's University Press, 1985), 137-143.

²⁷ "Weekly Intelligence Report - RCAF Station, Yarmouth, NS, 18 June to 24 June, 1943," 1, DHist 181.003 (D268).

²⁸ "Weekly Intelligence Report - RCAF Station, Yarmouth, NS, 16 July to 22 July 1943," 1, DHist 181.003 (D268); 162 (BR) ORB, 12 June 1943.

As a later entry noted, fried fish was featured on the menu after such practice attacks. Operations and training continued until the 27th, when fog and rain grounded the squadron's Cansos until the end of the month.²⁹

July began uneventfully, but two U-boat sightings on the 3rd brought some change to the routine of patrols and training at Yarmouth. The first sighting was made by a Fleet Air Arm Swordfish from No. 1 Naval Air Gunners School off Digby Neck in the Bay of Fundy. The submarine was seen to crash-dive, and the Swordfish contacted Yarmouth with news of the sighting. Canso "A" 9779 was sent up on a search for the U-boat which lasted over eight hours without result, and searches by two more aircraft also failed to find any trace of the suspected submarine.³⁰ Several hours after the sighting by the Swordfish, another sighting in a different location was made by one of 162 (BR)'s aircraft. Canso "A" 9755, flown by F/O J.J. Lawless and crew, on the return leg of a navigation training flight from Yarmouth to Dartmouth, reported sighting a submarine south of Halifax in position 44° 27' N, 64° 02' W. Since the aircraft was unarmed, no attack was made.³¹ The following day, Hudson 764/K3 of 31 OTU, based in Debert, NS, made an attack on a submarine at 43° 37' N 64° 03' W. This appeared to confirm the presence of a submarine in the area, but a reassessment several months later stated that "there is no tracking evidence to support the presence of a U-boat in this position at this time and the attack is assessed as 'Insufficient evidence of the presence of a U-boat'," which suggests that both sightings and the attack were the product of wishful thinking or misinterpretation of natural phenomena.³²

²⁹ *ibid.*, 21 June, 4 July 1943.

³⁰ The sighting was made in location 44° 00' N, 66° 35' W. No. 1 Naval Air Gunners School was based at Yarmouth and trained Telegraphist Air Gunners for service with the Royal Navy's Fleet Air Arm. It was operated by the Royal Navy in conjunction with the Royal Canadian Air Force. *ibid.*, 3 July 1943, "Weekly Intelligence Report - RCAF Station, Yarmouth, NS, 2 July to 8 July 1943," 1-2, DHist 181.003 (D268).

³¹ RCAF Station Yarmouth ORB, 3 July 1943, NAC, RG 24, C-12211; "Weekly Intelligence Report - RCAF Station, Yarmouth, NS, 2 July to 8 July 1943," 2, DHist 181.003 (D268). For unknown reasons, this sighting is not recorded in the squadron's ORB.

³² See DHist 181.003 (D1348) for details of this attack, which Douglas does not appear to mention. The RAF had established 31 OTU in May of 1941 as part of the British Commonwealth

The 4th also saw the arrival of Number 160 (BR) squadron from Sea Island, Vancouver. Also equipped with Canso "A"s, the new unit was given the task of replacing 162 (BR) at Yarmouth in order to free up the latter for operations elsewhere. The monotonously regular and uneventful escorting of the *Princess Helene* across the Bay of Fundy became 160 (BR)'s responsibility when it began operations in August. After the excitement of the sightings and of the arrival of a new squadron, life at Yarmouth returned to the normal routine of operational flying and training, much of which consisted of cross country navigational flights for new members of 162 (BR). Other training was less arduous. On 11 July, two crews were driven to nearby Lake Milo for dinghy practice. The ORB described it as "a perfect day for the exercise and it was enjoyed by all." Since Lake Milo was also a location for dances and water sports, including a boating club, the ORB's entry suggests that the training was not taken completely seriously.³³

By July 1943, the squadron had been using ASV Mark II for over a year, and although no sightings or attacks on submarines resulted from its use, the equipment had proven very useful for navigation and the successful completion of patrols. A report from Yarmouth on 7 July stated that

A.S.V. is still of great advantage, and more shipping with I.F.F. [Identification Friend or Foe] or responder beacons is picked up as time progresses, lowering the time necessary to locate convoys, escorts, etc.³⁴

Air Training Plan (BCATP), and the unit provided training in maritime reconnaissance. Douglas, The Creation of a National Air Force, 288.

³³ No. 160 (BR) remained in Yarmouth until August 1944, when it was transferred to Torbay, Newfoundland. *ibid.*, 515; Kostenuk and Griffin, RCAF Squadrons and Aircraft, 67; "Weekly Intelligence Report - RCAF Station, Yarmouth, NS, 16 July to 22 July 1943," 2, DHist 181.003 (D268); 162 (BR) ORB, 11 July 1943.

³⁴ The effectiveness of the ASV installations in 162 (BR)'s Cansos is discussed at this point because no earlier reports seem to have survived. ASV Mark II was no longer an effective means of detecting U-boats, since the entire fleet had been equipped with the *Metox* receiver from August 1942 onwards. *Metox* was capable of detecting emissions on the 1.5 metre wavelength and thus gave U-boats warning of the presence of a radar-using aircraft in time to allow the submarine to dive to safety. Eberhard Rossler, The U-boat: The evolution and technical history of German submarines, (London: Arms and Armour Press, 1981), 196; "R.C.A.F. Station Yarmouth, N.S. Weekly ASV Report for Week Ending 6/July/43," DHist 181.009 (D4928), vol. 1. IFF was a radar transponder system which distinguished friendly aircraft and ships on a radar screen by the addition of a flashing blip. By this date the earlier problems with damaged aerials caused by icing

Small convoys were picked up at ranges from twenty to fifty miles, a corvette was picked up at twelve, and troopships at thirty to forty miles. Aircraft were detected at ranges between six and twelve miles, but IFF allowed them to be detected at ranges up to ninety-five miles.³⁵ ASV was also useful for navigation, especially when the poor flying weather endemic to the Yarmouth area is considered. The ASV Mark II installations in 162 (BR)'s Cansos could pick up coastlines at ranges between twenty-five and eighty miles, and navigational beacons at ranges of up to ninety miles.³⁶ A report to EAC HQ on ASV in April of 1943 noted that

The present use of A.S.V. on this station is very satisfactory, but it must be remembered that this is, in a great part, due to the keenness of the air-crew in using it to pick up the beacons. Its navigational use in picking up the beacons is certainly not a "Secondary Consideration" to the Aircrew.³⁷

When the poor flying conditions frequently encountered by the squadron are considered, it is small wonder that the navigational uses of ASV Mark II were not considered "secondary" by aircrew.

August continued in much the same vein as previous months, with operational flying and training. The ORB recorded on 27 August that "many rumours are circulating regarding the movement of the Squadron to a new station. [This is] Causing a lot of worry on the part of living-out personnel. It was thought that the O.C. would bring back some definite word from E.A.C. but no news as yet."³⁸ The relatively good weather in August, coupled with the results of the squadron's training programme, led to over 870 hours of operational flying in August. Total flying hours, including training and testing, came to

had been remedied. CO, RCAF Station Yarmouth, to AOCinC, EAC, "Operational General Report on REL A.S.V. Mark II," 30 April 1943, 2, DHist 181.009 (D4928), vol. 2.

³⁵ See reports concerning 162 (BR) in DHist 181.009 (D4928), vol. 1, *passim*.

³⁶ *ibid*.

³⁷ RCAF Station, Yarmouth, NS, to AOC-in-C, EAC, "Operational General Report on REL ASV Mark II," 30 April 1943, 5, DHist 181.009 (D4928), vol. 2.

³⁸ 162 (BR) ORB, 27 August 1943.

almost 1200.³⁹ The last day of August marked a change in command, as S/L C.G.W. Chapman arrived was posted to the squadron by EAC to take over command from S/L S.D. Turner. The official handing over of command did not occur until 3 September.⁴⁰ On 7 September, S/L Chapman, the new OC, and S/L Gordon flew to Goose Bay, Labrador, “to look over the airport with the idea of the Squadron moving there for the winter.”⁴¹ The prospect of spending the winter in such unpleasant surroundings appeared to be eliminated by the message received on 22 September, ordering the squadron to Dartmouth, N.S. Thus began the first of a series of moves that would eventually take the squadron to Reykjavik, Iceland and to its famous burst of activity in June that led to the sinking of four U-boats and the sharing of the destruction of a fifth in the space of four weeks.

³⁹ *ibid.*, summary for August 1943. Some aircraft were still diverted to other airfields, like Dartmouth and Greenwood, at the end of their patrols because of fog at Yarmouth. See entries for 9 and 16 August for examples.

⁴⁰ *ibid.*, 31 August-3 September 1943.

⁴¹ *ibid.*, 7 September 1943.

Chapter 4

Movements in Canada, Movement to Iceland: September 1943 - January 1944

. . . the principle of watching continually over the cooperation of all forces, or in other words, of keeping constantly in view that no part of them should ever be idle. Whoever has forces where the enemy does not give them sufficient employment . . . he is a bad manager of his forces.

Clausewitz, *On War*

Throughout the war the disposition of Allied anti-submarine aircraft remained a contentious issue, as squadrons were shifted to meet the fluid pattern of the war. The often acrimonious discussions that surrounded these dispositions involved Eastern Air Command, and on several occasions had a direct effect on 162 (BR). The squadron's moves to Goose Bay and then to Reykjavik, Iceland, in late 1943 and early 1944 were the direct result of these negotiations and of the shuffling of Allied squadrons. Its posting to Goose Bay was a consequence of the battle surrounding convoys ONS 18 and ON 202 in late September of 1943 and the German attempt to renew the U-boat war in the mid-Atlantic. The squadron's subsequent posting to Iceland in January of 1944 was the result of the collapse of that offensive and the American withdrawal of two antisubmarine squadrons from the island. This reduction of strength led to a British request for a Canadian squadron to reinforce the Coastal Command forces on the island, and 162 (BR) was sent to fill the gap.

The series of moves that took 162 Squadron to Iceland began with the planned withdrawal of a USN B-24 squadron from Argentia, Newfoundland, in early August 1943. These plans caused concern at Coastal Command headquarters because the move would leave 10 (BR) as the only VLR squadron in Newfoundland, and indeed on Canada's East Coast.¹ Air Marshal Slessor, commander of Coastal Command, and Vice-Admiral

¹ Three USAAF B-24 squadrons, which had been operating from Gander since April 1943, had been ordered to England in late June of 1943 due to the diminished U-boat threat in the western Atlantic. Admiral King had proposed that since Newfoundland had a surplus of LR and VLR aircraft, the Army squadrons should be sent overseas to operate with Coastal Command.

Syfret, the British Vice-Chief of Naval Staff, realized that “the Canadians may feel they would be a little thin in Newfoundland if [the] situation changed[,] especially if [the United States] Navy squadron moves from Argentia.”² They proposed that if the U-boat threat were to move into the area covered from Newfoundland, Slessor could make 120 Squadron RAF, then stationed in Iceland, available to Eastern Air Command. It was felt that Canadian knowledge of this proposal might remove any Canadian misgivings about the moves then underway.³ Concerns about renewed U-boat activity were not unfounded. On 10 July 1943 a decrypted message from the Japanese Ambassador in Berlin revealed that Germany expected to be able to resume an effective submarine campaign in the North Atlantic at the end of August.⁴ The weapon with which Dönitz expected to renew the convoy battles was the T-5 acoustic homing torpedo, called *Zaunkönig* (wren) by the Germans and GNAT (German Naval Acoustic Torpedo) by the Allies. The torpedo was designed to home in on the noise created by ships travelling at between ten and eighteen knots, and was mainly meant for use against escorts.⁵

In early September, twenty-nine U-boats armed with the *Zaunkönig* homing torpedo, improved anti-aircraft weapons, and *Wanze*, a new device for detecting Allied radar emissions, sailed from ports in the Bay of Biscay, Norway, and Germany. They

Wesley Frank Craven and James Lea Cate, The Army Air Forces in World War II, Volume Two – Europe: Torch to Pointblank (Chicago: University of Chicago Press, 1949), 393-394; Max Schoenfeld, Stalking the U-boat: USAAF Offensive Antisubmarine Operations in World War II, (Washington: Smithsonian Institution Press, 1995), 130-133.

² Proposed draft signal written by Slessor and VCNS, 9 August 1943, PRO AIR 15/355.

³ *ibid.*

⁴ F.H. Hinsley, British Intelligence in the Second World War: Its Influence on Strategy and Operations: Volume Three, Part I, (New York: Cambridge University Press, 1984), 211. Hinsley has since stated that “the Japanese embassies in Europe were in the second half of the war to prove of immense Intelligence value because they were reporting back to Tokyo their versions of German assessments and their knowledge of German intentions. They were almost as valuable on some subjects (like for example the Normandy Landings) as were the direct Ultra from the German horse’s mouth.” Sir Harry Hinsley, “The Influence of Ultra in the Second World War,” Speech given at Babbage Lecture Theatre, Computer Laboratory, Cambridge, 19 October 1993.

⁵ Marc Milner, The U-Boat Hunters: The Royal Canadian Navy and the Offensive Against Germany’s Submarines, (Toronto: University of Toronto Press, 1994), 62-63.

included a “milch cow” tanker to refuel and resupply other submarines, increasing their useful time on patrol.⁶ By 19 September Group *Leuthen* had been formed, using nineteen of these boats. It lay astride the routes of the slow westbound convoy ONS 18 and the fast convoy ON 202 which was approaching it from astern.⁷ Enigma decrypts and other intelligence allowed the Admiralty to order a change in course for the convoys in an attempt to avoid *Leuthen's* patrol line, and to provide increased surface and air support for the endangered ships. The change in course was not drastic enough, however, and shortly before midnight on 19 September, *U-402* sighted ONS 18.⁸

The ensuing battle, which lasted until 23 September, was punctuated by fog which not only interfered with the provision of air cover but also hindered the actions of U-boats and escorts alike. The U-boats, using both conventional torpedoes and *Zaunkönig*, sank six merchant ships and three escorts. Another escort was damaged so severely that she was declared a “constructive total loss”.⁹ In return Canadian VLR Liberators, operating from Iceland and Newfoundland, sank *U-341* and damaged *U-270* so seriously that she was forced to return to base, while one of the escorts, HMS *Keppel*, rammed and sank *U-229* on the 22nd. The following evening, Dönitz ordered the U-boats to withdraw because

⁶ 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), 562.

⁷ The battle surrounding convoys ONS 18 and ON 202 has been examined by several authors. See, among others, Jürgen Rohwer and W.A.B. Douglas, “Canada and the Wolf Packs, September 1943,” in The RCN in Transition, 1910-1985, W.A.B. Douglas, ed. (Vancouver: University of British Columbia Press, 1988), 159-186; Milner, The U-Boat Hunters, 59-73; Douglas, The Creation of a National Air Force, 562-567; Great Britain, Air Ministry, Air Historical Branch, “The RAF in Maritime War, Volume IV: The Atlantic and Home Waters - The Offensive Phase, February 1943 to May 1944,” 175-180; Alfred Price, Aircraft Versus Submarine: The evolution of the anti-submarine aircraft, 1912 to 1980, (London: Jane's, 1980), 173-175. For a contemporary German perspective, see Günter Hessler, The U-Boat War in the Atlantic, 1939-1945, Volume III: June 1943-May 1945, (London: HMSO, 1989), 23-27.

⁸ Douglas, The Creation of a National Air Force, 562; Rohwer and Douglas, “Canada and the Wolf Packs,” 167-8.

⁹ Milner, The U-Boat Hunters, 71, 65.

of fog and because of their increasing proximity to the Canadian and American air bases in Newfoundland.¹⁰

The battle surrounding ON 202 and ONS 18 provoked an immediate reaction from Coastal Command. On 21 September, while the battle was still raging, it ordered 59 Squadron RAF, which had only recently moved to Ballykelly in Northern Ireland, to make preparations to reinforce Reykjavik either with a detachment of its VLR Liberators or with the entire squadron if necessary. Additionally, 15 Group was withdrawn from operations in the Bay of Biscay and was reallocated to convoy coverage. The seriousness with which the acoustic torpedo threat was taken is demonstrated by Coastal Command's removal of 15 Group from the Bay offensive, which it had supported in the face of criticism from others, especially Admiral King, and its reassignment to convoy coverage.¹¹

The renewal of the U-boat offensive in the Atlantic also concerned Rear Admiral Mansfield, the senior British member of the Allied Anti-Submarine Survey Board. On 25 September, he sent a personal message to Slessor expressing concern about the VLR situation in Newfoundland.¹² This concern was further demonstrated by a suggestion from

¹⁰ Douglas, The Creation of a National Air Force, 565. *U-341* was sunk by Liberator A/10 of the RCAF, and *U-270* was damaged by Liberator L/10. Available sources claim that *U-338* was sunk by F/120 of the RAF, but the cause of its loss has since been reassessed as unknown, although HMCS *Drumheller* may have been partially responsible for its destruction. *ibid.*, 562-564; Air Ministry, "The RAF in Maritime War," IV, 177-179.; Norman L.R. Franks, Search Find and Kill: Coastal Command's U-boat Successes, (Bourne End: Aston Publications, 1990), 136; Robert C. Fisher, "Axis Submarine Losses to Canadian Forces, 1939-1945," 7, June 1995, DHist.

¹¹ C.G Jefford, RAF Squadrons: A Comprehensive Record of the Movement and Equipment of all RAF Squadrons and their Antecedents since 1912, (Shrewsbury: Airlife Publishing, 1988), 44; HQCC to 15 Group, Iceland, signal A.872, 21 September 1943, PRO AIR 15/355. After their reassignment, 15 Group operated according to "Stipple" signals, which assessed the U-boat threat to convoys at sea and assigned air cover accordingly. The "Stipple" system was implemented by the Admiralty on 10 May 1943 and was issued daily, as were Coastal Command's "Tubular" messages, which described U-boat probability areas based on intelligence, especially Ultra. The "Tubular" messages were used to plan and co-ordinate air patrols by Coastal Command's 15 Group, Eastern Air Command, and No. 1 Group in Newfoundland. Douglas, The Creation of a National Air Force, 556. See Map 5 for the areas covered by the various Coastal Command Groups.

¹² The Allied Anti-Submarine Survey Board was created by the Admiralty and the USN. It was originally proposed at the Casablanca Conference in January of 1943, and was brought into being in early March of 1943, immediately after the Atlantic Convoy Conference. There were four

the RAF Delegation in Washington of either a further allocation of VLR aircraft to EAC or the transferring of a USN or USAAF VLR squadron to Newfoundland. On the 28th, Coastal Command in Iceland was notified that 59 Squadron would maintain its detachment of Liberators at Reykjavik until further notice, and that preparations should be made to accommodate the entire squadron on a temporary basis if necessary.¹³

On 30 September the Admiralty sent an appreciation to COMINCH, in which its concern about the German acoustic torpedo and the losses it had inflicted on ONS 18 and ON 202 was clear:

Owing to forthcoming commitments and recent escort casualties in convoy battle we are weaker in surface escorts than we were in April . . . Until we have supplied escort vessels with counter to acoustic torpedo it is imperative to reduce scale of attack with which they have to deal. This can be done in two ways, by strengthening the air cover on Northern Routes and by increasing the numbers of surface escorts.¹⁴

The Admiralty was prepared to transfer an additional VLR squadron from the Bay offensive to the northern convoy route, and requested that COMINCH consider reinforcing EAC with a VLR squadron, even at the expense of the Bay offensive. Admiral King believed that the proposed transfers would not be necessary, since a base on the Azores would become available on the 8th of that month. It would provide additional air cover for

members, two British and two American, each country having one naval and one air representative. It was meant, in Slessor's words, "to study the organisation and disposition of British and American surface and air anti-submarine forces throughout the Atlantic area and make recommendations to Cominch [Admiral King] and the First Sea Lord about how matters could be improved." John Slessor, The Central Blue: Recollections and Reflections (London: Cassell & Co., 1956), 496. For a discussion of the Board's dealings with EAC, and their recommendations for its improvement, see Douglas, The Creation of a National Air Force, 556-559. Mansfield suggested that the British air member of the Board visit St. John's and Gander and investigate the VLR situation before returning to the United Kingdom after the dissolution of the Board on 28 September. Mansfield to Slessor, 1731Z, 25 September 1943, PRO AIR 15/355. On 28 September, Slessor agreed. Headquarters Coastal Command to RAF Delegation, Washington, signal A.876, 28 September 1943, PRO AIR 15/355.

¹³ RAF Delegation, Washington to Air Ministry, Whitehall, signal MS.19449, 28 September 1943, PRO AIR 15/355. The message also observes that the Canadians "appear to dislike" the idea of reinforcement by an American naval squadron. Headquarters Coastal Command to 15 Group Iceland, signal A.878, 28 September 1943, PRO AIR 15/355.

¹⁴ Admiralty to COMINCH, 1621A, 30 September 1943, PRO AIR 15/355. The assessment was repeated to NSHQ in Ottawa, the British Air Delegation in Washington, the Air Ministry in London, and COMNAVEU (Admiral Stark, USN) in London.

Atlantic convoys, especially those on the southern route.¹⁵ King also claimed that reinforcement of Newfoundland had been considered, but that EAC had advised him that USN support was not necessary. King stated that, if necessary, a Navy VLR squadron would be removed from the Bay offensive to provide support in the eastern Atlantic.¹⁶

Coastal Command was concerned by King's response. In its opinion, operations from the Azores would not be possible until the end of October at the earliest. Furthermore, additional coverage from Newfoundland of the northern convoy route had already become necessary, since two squadrons assigned to the North Atlantic were moving to the Azores and would be unavailable for convoy coverage until the moves were complete. Since it was considered unlikely that these squadrons would be available in time, Eastern Air Command proposed to move an entire Canso squadron to Goose Bay in order to conserve 10 (BR) for "really long-range convoy cover" over the middle of the Atlantic. That same day, Coastal Command requested that EAC take immediate action on its proposal. It was anticipated that the situation would change by early November, when

¹⁵ The British had been negotiating with the Portuguese government since 1941 for the use of the islands as an air base. An agreement was finally reached in August of 1943, and bases were made available from 8 October of that year. The use of the Azores by American aircraft was not settled until 1944; until then, American aircraft based there operated under the control of Coastal Command's No. 19 Group in order to avoid disputes with the Portuguese government. For a description of American attempts to gain an air base in the Azores, see J.K Sweeney, "Genesis of an Airbase: The United States, Portugal, and Santa Maria," Aerospace Historian, 24:4 (Winter/December 1977), 222-227; S.W. Roskill, The War at Sea 1939-1945, Volume III: The Offensive, Part I (London: HMSO, 1960), 46-47; Air Ministry, "The RAF in Maritime War," IV, 207-209. The "southern route" was another great circle route across the Atlantic. It usually passed just south of Sable Island and north of the Azores.

¹⁶ COMINCH to Admiralty, 1301Z, 2 October 1943, PRO AIR 15/355. This reply from King appears to indicate an ignorance of the logistics of such a move and perhaps of maritime air operations in general. It would take at least several weeks to move a squadron and its ground equipment from England to Newfoundland, and the squadron would have to rely on external resources, most likely those of the RCAF, until then. Any delays would be crucial if a VLR squadron were urgently required in Newfoundland. For a description of the problems encountered by USAAF Liberator squadrons in moving from North America to England, which provides some idea of the problems that would likely have been encountered, see Schoenfeld, Stalking the U-boat, 20-24, 131-133.

part or all of the squadron would be withdrawn from Goose Bay.¹⁷ The squadron in question was 162 (BR).

The squadron had been devoting more time to training since August, as 160 (BR) became more familiar with operations from Yarmouth and began to take over some of 162's responsibilities. Out of 1183 hours of flying in August, some 872 had been operational and 282 had been spent training, with the remainder devoted to testing and ferrying. In September the total flying time fell to 710 hours. Operational flying consumed almost 350 hours, while 347 hours were devoted to training.¹⁸ The decrease in total flying hours for September was due largely to the squadron's impending move, but the absolute increase in time spent training as well as the change in proportions of flying time devoted to training as opposed to operations is noticeable.

The increase in training at the expense of operational flying was not popular with the members of the squadron. The squadron's ORB noted on 8 September that "with 160 Squadron taking over operational patrols, our Sqdn is finding it difficult to keep busy."¹⁹ Persistent rumours of a move to a new base, however, sustained the squadron's morale, as did the ongoing buildup in its strength. Squadron Leader Chapman's visit to Goose Bay on 7 September undoubtedly contributed to the rumours of the squadron's impending relocation.²⁰ On 22 September the rumours were confirmed as the squadron received orders posting it to Dartmouth. Two days later, six Cansos were detached to the USAAF base at Stephenville (about 40 miles southwest of Cornerbrook) in Newfoundland on temporary duty to provide air coverage in the Gulf of St. Lawrence. The squadron ORB

¹⁷ Draft signal, HQCC to COMINCH, 4 October 1943; HQCC to EAC, signal A.895, 4 October 1943, PRO AIR 15/355.

¹⁸ 162 (BR) ORB, summaries for August and September 1943. Flying times are rounded to the nearest hour.

¹⁹ *ibid.*, 8 September 1943.

²⁰ "The History of Eastern Air Command," unpublished narrative [1945], 648, DHist 74/2, vol. 4; 162 (BR) ORB, 7 September 1943. Neither the ORB nor the Weekly Intelligence Reports from Yarmouth makes any direct mention of morale problems in the squadron, although a "slight attack" of dysentery that affected most of the squadron in September may also have had some effect on morale. *ibid.*, Summary for September 1943.

noted that “the boys were quite excited about this move and are looking forward to some good hunting.”²¹ This was not to be the case; by 27 September EAC Headquarters admitted that the “urgent operational need” for the Cansos had diminished, but suggested keeping them in Newfoundland so that the crews could gain experience in operating from bases on the island, although EAC anticipated withdrawing the Cansos in early October if the situation had not changed.²²

By 30 September at least two of the detached aircraft were operating from Gander, where they provided urgently needed convoy coverage in the face of the renewed U-boat offensive. Canso “A” 9810 provided assistance on 4 October to the *Empire Activity*, which had run aground near Musgrave Harbour. The squadron’s ORB mentions that at least four of the squadron’s Cansos were at Gander on 6 and 8 October.²³ In the meantime, the remainder of the squadron continued to prepare for its move to Dartmouth. On 27 September the Officer Commanding and other senior officers flew to Dartmouth to examine the station and make arrangements for the squadron’s arrival. Three days later an advance party of ninety-seven ground personnel left for Dartmouth by train. Poor weather prevented the aircraft and the remainder of the squadron from leaving Yarmouth until 3 October, when the nine Cansos made a formation flight to Dartmouth.²⁴

²¹ *ibid.*, 22-24 September 1943; Command Controller to CO Yarmouth, signal AO-398, 23 September 1943, DHist 181.002 (D175). The transfer of a detachment to Stephenville was apparently the result of AFHQ’s attempt to implement 162’s role in the 1943 plan for aerial defence of shipping in the St. Lawrence. The plan and its significance for 162 (BR) is discussed in Chapter 3 of this thesis. The detachment may also have been sent to Stephenville as part of the plan to capture *U-536* as it attempted to rescue escaped German prisoners of war in the Baie de Chaleur, but Douglas states that the RCN “did not bring the RCAF into the picture”. Douglas, The Creation of a National Air Force, 515. For more information on the planned German escape and rescue and the Canadian countermeasures, see Michael L. Hadley, U-Boats Against Canada: German Submarines in Canadian Waters, (Kingston: McGill-Queen’s University Press, 1985), 175-183.

²² HQ EAC to No. 1 Group, signal A.238, 27 September 1943, DHist 181.002 (D170).

²³ RCAF Station Gander, Newfoundland ORB, 30 September - 4 October 1943; 162 (BR) ORB, 4-8 October 1943. Musgrave Harbour is approximately 40 miles northeast of Gander.

²⁴ *ibid.*, 30 September - 3 October 1943.

Almost immediately afterwards, on 5 October, orders were received from EAC posting all of 162's serviceable aircraft to Goose Bay.²⁵ While a posting to Goose Bay allowed 162 (BR) to cover convoys on a northern routing and thus leave 10 (BR) Liberators free for very long range convoy coverage, the station suffered from some disadvantages as a base for anti-submarine and convoy protection operations, both because of its facilities and because of its location. In an analysis of RCAF A/S operations written in early 1943, Goose Bay was described as having

an excellent airdrome but limited accommodation. What is even more important for an operating base is that it has only W/T communications and this is subject to fadeout at critical periods. . . . But an important point to consider is that aircraft going from Goose Bay to meet a convoy have to pass over up to 250 miles of unproductive water in doing so. That is, the submarines rarely, if ever, find it necessary to operate in these waters, and there is not the same chance of an aircraft meeting a lurking U-boat that it would have if it were proceeding along the line of the main convoy routes joining Gander to Iceland.²⁶

Despite Goose Bay's deficiencies, the necessity of providing coverage for Atlantic convoys in the face of a renewed U-boat offensive led to 162 (BR)'s deployment to the air base in Labrador for three weeks.

Six aircraft and one hundred and forty-two personnel left Dartmouth for Goose Bay on 6 October, with two of the Cansos on detached duty at Gander also making the trip the same day. Six officers and one hundred and eight other ranks remained in Dartmouth in order to service the three remaining aircraft and set up the squadron's equipment on the base, since Dartmouth remained the squadron's headquarters and its base for servicing aircraft. By 9 October nine aircraft were in Goose Bay, one was at Yarmouth having its engines changed, and five were at Dartmouth awaiting spare parts. Goose Bay had received little notice of the squadron's arrival, but was able to accommodate them in newly constructed buildings.²⁷ Most of 162's flying after its arrival at Goose Bay consisted of

²⁵ *ibid.*, 5 October 1943.

²⁶ C.L. Annis, "Submarine Warfare, World War II", 29 January 1943, 3, DHist 181.009 (D1151).

²⁷ 162 (BR) ORB, 6-9 October 1943. The records about the movement of the squadron are confusing and contradictory; the Goose Bay ORB implies that thirteen aircraft had arrived by 6

local familiarisation and practice flights. Radio range flying, which permitted landings in poor weather, was practised, as were depth charge attacks and air firing of machine guns.²⁸ A search for a missing RCAF scow intermittently occupied some aircraft until 17 October, and coverage was provided on the 14th and 15th for an American ship, the *Cartago*, which had holed itself on an uncharted reef. A coastal reconnaissance flight to Cape Chidley, Labrador's most northerly point, and back was carried out on 15 October. It came within a week of encountering *U-537*, which established an automated weather station in this area on 22 October.²⁹ Only four operational missions were flown by the squadron while at Goose Bay; far more time, as has been mentioned, was spent on practice flights.

During the nineteen days that the squadron was at Goose Bay, training and familiarisation flights occupied 174 flying hours. Operational flying, including a reconnaissance flight and the search for the missing scow, consumed just over 67 hours. The squadron's focus on training instead of convoy protection was largely the result of the changing dispositions of U-boats in the Atlantic. Group *Leuthen*, which had attacked ONS 18 and ON 202 and which was subsequently reformed into group *Rossbach*, then group *Schlieffen*, was by then operating out of the range of EAC's Cansos. Since the positions and intentions of the U-boats were known to the Allies via signals intelligence, the squadron did not spend time patrolling unthreatened convoys within their operational range because EAC was aware of which convoys needed air support and which did not. In any case, Allied knowledge of U-boat dispositions in the North Atlantic allowed almost every convoy to be successfully diverted away from the threat.³⁰

October, eight of which had arrived on the previous day, when according to the 162 (BR) ORB no aircraft had made such a flight.

²⁸ *ibid.*, 7-22 October 1943.

²⁹ 162 (BR) ORB, October 1943; RCAF Station Goose Bay ORB, 14-15 October 1943. For more information on the weather station and its eventual rediscovery, see W.A.B. Douglas, "Beachhead Labrador," *MHQ: The Quarterly Journal of Military History*, 8:2 (Winter 1996), 35-37; Douglas, "The Nazi Weather Station in Labrador," *Canadian Geographic*, 101:6 (December 1981/January 1982), 42-47.

³⁰ See Hessler, *The U-Boat War in the Atlantic*, III, 27-33, for details of the dispositions of the U-boats. From September to December 1943, the U-boat Enigma was broken almost without

Despite the squadron's detached service in Goose Bay, its position in Dartmouth for the winter of 1943-1944 must have seemed secure. Negotiations between the Canadian and the British, however, were to affect the squadron yet again. On the day after 162 (BR) was ordered to Goose Bay, Johnson and Slessor were already considering its future employment. In a message from the two to RCAF Headquarters in Ottawa concerning anti-submarine aircraft dispositions in the North Atlantic after the forthcoming occupation of the Azores, Johnson suggested moving 162 to the Azores from Goose Bay once the majority of convoys were using the southern route. The Cansos could shuttle between there and Torbay when necessary.³¹ Ottawa replied on 8 October, pointing out two flaws in Johnson's argument. First, while the prevailing westerly winds would make it possible for Newfoundland-based LR (long range) aircraft to divert to the Azores, the return trip would only be feasible "under [the] most favourable weather conditions owing [to the] pronounced reduction [of] Canso range under adverse winds."³² Second, the same winds would make it difficult under normal weather conditions for LR air coverage from Newfoundland to overlap with LR air coverage from the Azores even if a Canso "A" squadron were based there. In light of these problems, Ottawa suggested that the

delays, which were rarely more than a few days in any case. Hinsley, British Intelligence in the Second World War, III, pt. 1, 223-224. EAC Liberators had sufficient range to cover threatened convoys in mid-ocean from Goose Bay, but Gander was a more advantageous base for VLR operations. Since May 1943 EAC had been basing its patrols on "Stipple" and "Tubular" messages, which determined the U-boat threat to convoys and which outlined U-boat probability areas based on Ultra. The OIC in Ottawa also issued "Otter" messages that provided additional information about the Canadian coastal area. "Intelligence Report for period Oct. 15th to 21st inclusive," DHist 181.003 (D3568). Douglas, The Creation of a National Air Force, 556-559.

³¹ HQCC to HQ RCAF, Johnson and Slessor to Anderson (Personal), signal A.900, 6 October 1943, 2, PRO AIR 15/355. Johnson was in England at this time, and so was able to send a joint message with Slessor. *ibid.*, 3. This was not the first time that Canada had offered to send EAC anti-submarine squadrons overseas. In September 1941 the Air Staff had offered to send 5 (BR) and 116 (BR) overseas to operate Cansos loaned to the RAF. The offer was refused because the aircraft were needed to replace wastage in RAF units and therefore additional personnel were not required. Douglas, The Creation of a National Air Force, 390.

³² AFHQ Ottawa to HQCC, Anderson to Johnson and Slessor (Personal), signal C.885, 8 October 1943, 1, PRO AIR 15/355.

movement of 162 (BR) to the Azores be postponed until some experience of Canso "A" operations on the southern convoy route had been gained.³³

While discussions about its future continued, 162 (BR) operated from Goose Bay, and the Allied navies hurried to implement countermeasures to the new German acoustic torpedo. The Admiralty assessment of 30 September quoted above was, Slessor and Johnson stated on 6 October, "mainly concerned with [the] immediate situation in [the] next few weeks during which Azores cover will not be available and escort vessels will not yet be fitted with counters to [the] acoustic torpedo."³⁴ As this message suggests, countermeasures were already in hand. The RCN, in fact, had produced its own noise making decoy, the CAT (Canadian Anti-Acoustic Torpedo) gear, by 24 September, the day after the U-boats had disengaged from ONS 18 and ON 202. The RN had its own, more complicated version called FOXER ready shortly thereafter. Although countermeasures had been developed, they were not officially approved until late 1943, largely due to concerns that the Germans' new weapon was actually an acoustic mine released in the path of oncoming convoys by U-boats and not an acoustic torpedo homing on to the ships.³⁵ Despite inconclusive information on the new German weapon, and a lack of countermeasures in the weeks following the battle surrounding ONS 18 and ON 202, the threat to convoys was lessened by Allied successes against the U-boats taking part in the new offensive. The U-boats suffered heavy losses, mainly from aircraft attacks, while

³³ *ibid.*, 1-2. Presumably Ottawa is referring to possible American PBY-5A operations from the Azores instead of Canso "A" operations by the RCAF.

³⁴ HQCC to HQ RCAF, signal A.900, 6 October 1943, 1, PRO AIR 15/355.

³⁵ The Allied noisemakers were ready in such short order because of Admiralty warnings in April 1943 that a German acoustic torpedo, "Taffy", which was not the same as *Zaunkönig*, had entered service. Countermeasures had been under consideration for some time, so a rapid reaction was possible when the T-5 entered service. The CAT gear proved superior to FOXER, mainly because it was easier to deploy, was more durable, and could be towed at greater speeds. CAT gear was not officially approved as the RCN's anti-acoustic torpedo equipment until mid-December 1943. For a full discussion of this topic, see Milner, The U-Boat Hunters, 62-63, 72-76.

Allied escort and merchant ship losses were minimal in comparison.³⁶ Between 15 September and 7 November, twenty U-boats were lost on the North Atlantic convoy routes, while only four Allied escorts and eight merchant ships were lost to submarine attack. In early November, high submarine losses in return for very limited successes compelled Dönitz to end his attempt to renew wolf pack attacks on convoys in the mid-Atlantic, and removed the main reason for 162 (BR)'s continued presence in Goose Bay.³⁷ By this time, however, a tragedy within Eastern Air Command had already called the squadron elsewhere.

On 19 October 1943, Liberator 3701 of 10 (BR) left Gander on a familiarisation flight to Chatham, New Brunswick, Mont Joli, Quebec, Presque Isle, Maine, Greenwood and Sydney, Nova Scotia, returning to Gander. Twenty-four personnel, many on leave and taking advantage of the flight to Canada, were on board. At about 0200 GMT on 20 October, Mont Joli advised the approaching aircraft to continue to Montreal, since Mont Joli was closed down due to fog. The Liberator was not heard from again. A massive search was undertaken for the missing aircraft, although poor weather along the St. Lawrence prevented any flying on the 22nd. The squadrons stationed along the St. Lawrence were joined in the search by other units, including the newly formed 168 (Heavy Transport) squadron from Rockcliffe, near Ottawa, and 162 (BR) whose Cansos left Goose Bay for Mont Joli between 22 and 24 October.³⁸

That Eastern Air Command could spare an entire squadron of long-range maritime patrol aircraft for such a search is evidence of the greatly diminished threat to shipping off

³⁶ Douglas and Rohwer, "Canada and the Wolf Packs," 183. The numerous instances of GNATs detonating prematurely reduced the effectiveness of the new weapon against the escorts and led to inflated claims of success by U-boat commanders.

³⁷ David Syrett, The Defeat of the German U-Boats: The Battle of the Atlantic, (Columbia: University of South Carolina Press, 1994), 227. Twelve of the submarines were lost to aircraft without assistance from escort vessels. *ibid.*, 228.

³⁸ Carl Vincent, Canada's Wings, vol. 2: Consolidated Liberator and Boeing Fortress, (Stittsville: Canada's Wings, 1975), 46-47, 118-119; 10 (BR) ORB, 19-23 October 1943; 162 (BR) ORB, 22-24 October 1943. See DHist 181.003 (D2689) for messages outlining the ADC's part in attempting to locate the missing Liberator.

Canada's Atlantic coast following the failure of the renewed U-boat offensive. It is also evidence of its greatly increased strength in anti-submarine (especially Canso) squadrons in comparison with the previous year. The effect on Mont Joli of the sudden arrival of so many aircraft, as well as the optimism EAC apparently felt about the search, is shown in a signal sent to the station by EAC Headquarters on 6 November, which apologized for the lack of warning, but expected that the squadron would only stay another four or five days.³⁹ The squadron was in fact at Mont Joli for almost three more weeks. Between 25 October and 24 November, the squadron flew a total of 642 hours in an unsuccessful search for the missing Liberator as well as for a missing Hawker Hurricane. On 25 November, EAC called off the search. Twelve of the thirteen Cansos at Mont Joli returned to Dartmouth the following day; the thirteenth, Canso "A" 9779, was unserviceable and remained at Mont Joli with its crew until 6 December. The missing Liberator was not found until June 1946, when its wreckage was discovered near St. Donat, Quebec, some fifty miles north-northwest of Montreal.⁴⁰

The squadron's return to Dartmouth on 26 November marked the first time that the detached air and ground crews had been at their home base in over two months. The squadron's ORB had already noted in October that

The past month has been rather hard on the Squadron. The constant moving of the aircraft and personnel has kept the Administrative staff working overtime to try to keep their records up to date. The aircrew and ground crew have been travelling light and look very shabby. They are badly in need of a Clothing parade. Many of the Squadron personnel have not even cleared from Yarmouth yet, although the

³⁹ HQ EAC to Mont Joli, 6 November 1943, DHist 181.002 (D175). Immediately following the crash, EAC had believed that the search would take at most two weeks, and the message on 6 November seems to maintain this optimism. HQ EAC to Goose Bay, signal A.271, 22 October 1943, DHist 86/129.

⁴⁰ 162 (BR) ORB, 25 October - 6 December 1943. Vincent, Liberator and Fortress, 46-47. It has not been possible to establish the identity of the missing Hurricane. The microfilm copy of the Mont Joli ORB is incomplete, and due to the transfer of the original from DHist to the National Archives, it is temporarily unavailable to researchers. A search of the ORBs of all the squadrons that might have operated Hurricanes in eastern Canada failed to find any mention of a missing aircraft at this time. #9 Bombing and Gunnery School, which was based at Mont Joli, did not operate Hurricanes. Samuel Kostenuk and John Griffin, RCAF Squadron Histories and Aircraft, 1924-1968, (Toronto: Samuel Stevens Hakkert & Company, 1977), 230.

movement was affected [sic] October 1st. The whole Squadron feel they would like to get settled some place where they could gather their belongings together and call home.⁴¹

The November summary elaborated on the effects of the squadron's lengthy detached service at Goose Bay and especially at Mont Joli:

Due to a complete lack of heated hangars the maintenance and servicing of aircraft at Mont Joli was exceedingly difficult. The temperature was generally cold and on several occasions, dropped down to 0° F. This cold, together with [a] complete lack of engine heaters, as well as hangars, made starting of aircraft a very great problem. . . . It was impossible to wash aircraft so that they became very dirty both outside and inside. On arrival back at Dartmouth, all aircraft have been grounded for [a] complete check and clean-up.⁴²

A comprehensive training plan was made for the squadron now that it had returned to its permanent base. The move from Yarmouth to Dartmouth had originally been intended to provide winter accommodation for squadrons located at "summer bases" such as Yarmouth, but in the case of 162 (BR), the deployment to the seaplane base at Dartmouth had also been intended to test the feasibility of operating the Canso "A" as an amphibian during the winter.⁴³ The squadron had already been carrying out other tests; starting on 13 November Canso "A" 9754, which had returned to Dartmouth from Mont Joli on 2 November for a major check, carried out training on what the ORB cryptically refers to as "Babs". This was the blind approach beacon system, or BABS, which had been developed in 1942 by the RAF. It used a directional radar transponder to provide both range and a

⁴¹ 162 (BR) ORB, Summary for October 1943.

⁴² *ibid.*, Summary for November 1943.

⁴³ "Eastern Air Command Movement Order No. 19 - No. 162 Squadron", 25 September 1943, NAC RG 24, vol. 5209, file HQS.17-1-3, "Bomber Reconnaissance Squadrons - Organisation and Establishment of"; 162 (BR) ORB, Summary for November 1943. It may seem unusual that EAC had not already operated Canso "A"s as flying boats during the winter, since the type had been in service with the RCAF since 1942. It should be remembered that during the previous winter Canso "A"s were EAC's longest-ranged maritime patrol aircraft and were in limited supply. The withdrawal of 116 (BR)'s Canso and Catalina flying boats from Botwood and 10 (BR)'s Digbys from Gander in the winter of 1942, discussed in Chapter 2 of this thesis, had forced EAC to deploy 5 (BR), which operated Canso "A"s, as a land-based squadron at Gander in order to provide coverage. Two of 162 (BR)'s aircraft had also been sent to Gander in late December of 1942 to augment EAC's limited long-range capability. During that winter, EAC had not had Canso "A"s to spare for water-based operations; they had been required to cover the threatened Atlantic convoys. By the winter of 1943, however, EAC had VLR Liberators based at Gander, and had a surplus of Canso squadrons. They could therefore spare 162 (BR) to operate as a flying boat squadron from Dartmouth during the winter without endangering the convoys.

glide-path for the approaching aircraft, which allowed landings in poor weather conditions.⁴⁴ This Canso was the only aircraft used at that time for testing BABS, which suggests that it had not yet been fitted to other aircraft in the squadron. The squadron's prolonged detached service at Goose Bay and Mont Joli, and the maximum effort search for 10 (BR)'s missing Liberator, would certainly have allowed little opportunity to install this equipment in other aircraft. The fact that the tests were carried out by only one pilot also suggests that BABS was a new addition to the squadron's radar equipment. If so, EAC appears once again to have been lagging behind other maritime air forces in modernising its equipment.

While the squadron's future employment in Dartmouth now seemed relatively certain, actions at the highest levels of command in Britain, the United States, and Canada would in less than a month bring about 162 (BR)'s redeployment to Iceland. On 3 November Slessor had sent a personal letter to Johnson, in which he discussed the future disposition of 162 (BR), although the squadron itself was not actually named. Johnson's earlier proposal to deploy a Canso squadron to Terciera in the Azores was turned down, even though such a deployment would have allowed Coastal Command to remove one of its Hudson squadrons from service and re-equip it with more modern and capable Liberators. Slessor admitted that instead of one of the Canso squadrons, a USN Liberator squadron would probably be deployed to the Azores on the insistence of the Americans, and that on "political grounds" he would have to agree to the move.⁴⁵ Since a Canadian

⁴⁴ 162 (BR) ORB, 2-18 November 1943; F.C. Richardson, "Radionavigation in the UK in World War II," *The Journal of Navigation*, 45:1 (January 1992), 68. A report on BABS had been made by RCAF Overseas Headquarters in February 1942, and a prototype installation, consisting of a modified Mk. IIG IFF set, was ordered at Rockcliffe Airfield in May of the same year. The first installation was made at Gander, Newfoundland in June. Instead of Research Enterprises Limited being given the contract for producing the equipment, No. 1 Radar Maintenance Unit at Scoudouc, New Brunswick was ordered to produce it. Unfortunately, the installation of BABS at other RCAF bases was delayed until the middle of 1943. By January 1945 there were eight installations at East Coast bases. C.B. Limbrick, "Radar in the Royal Canadian Air Force," 28, DHist 71/376.

⁴⁵ Personal letter from Slessor to Johnson, 3 November 1943, 1, DHist 181.002 (D175). The Americans had been pressing for permission to operate from the Azores, but the Portuguese

presence in the Azores would not be possible, Slessor suggested that the Cansos might be sent to reinforce Iceland, since

it strikes me [Slessor] as possible that, when the southern route is the standard convoy route, you may have more long-range aircraft in NOVA SCOTIA and NEWFOUNDLAND than you need to cover your commitments. In ICELAND on the other hand we are very short of aircraft with decent range to cover the FAEROES-ICELAND passage We had a U.S.N. amphibious CAT. squadron there which was extremely useful, but which has now been replaced by a P.V.1 [Ventura] squadron which, with its limited range, is very little use; and, as I say, 269 with its HUDSONS is also of very limited value now. So that only leaves 120 [Squadron] (LIBERATORS) to do ICELAND'S share of the Northern Passage plus cover for any convoys that may for any reason be diverted to the old northern convoy route. If you sent your CANSO squadron from GOOSE [Bay] to REYKJAVIK, that would release 269 for re-equipment with some aircraft that is of more general use than the old HUDSON today.⁴⁶

If Johnson proved agreeable, Slessor stated that he would have the Air Ministry make a formal suggestion about the movement of a Canso squadron to Iceland to RCAF Headquarters in Ottawa.⁴⁷

This proposal addressed British concerns about being able to patrol the Northern Passage (also called the Northern Transit Area), which lay between Iceland and the British Isles, with aircraft. In late October of 1943, the Admiralty had warned the British Admiralty Delegation (BAD) in Washington that

Even if all the U.S. squadrons were retained, we should still not have adequate resources to put a really effective stop on the Northern Passage while at the same time making the best of the excellent opportunities that present themselves to kill U-boats around convoys in the mid-Atlantic. When the U.S. squadrons are withdrawn we shall have to make up our minds that the Northern Passage, through

government was reluctant to grant them a base in the islands. See Sweeney, "Genesis of an Airbase".

⁴⁶ *ibid.* The USN Squadron was VP-84, which had operated from Iceland between September 1942 and August 1943, during which time they sank several U-boats. Andrew Hendrie, Flying Cats: The Catalina Aircraft in World War II, (Shrewsbury: Airlife, 1988), 37-41. 269 Squadron was never re-equipped with Liberators, but operated Hudsons and later Warwicks from the Azores in the air-sea rescue role with airborne lifeboats. Jefford, RAF Squadrons, 81; Stephen Brewster Daniels, Rescue From the Skies: the Story of the Airborne Lifeboats, (London: HMSO, 1993), 185.

⁴⁷ Personal letter from Slessor to Johnson, 3 November 1943, 2.

which increasing numbers of U-boats are once more passing into the Atlantic, can only be patrolled very sporadically.⁴⁸

If a Canadian squadron operating long-range aircraft, namely Canso "A"s, could be deployed to Iceland, Coastal Command would be able to patrol the Northern Passage much more frequently while also maintaining patrols in the mid-Atlantic. The collapse of the U-boat offensive in November meant that even heavier patrolling could be carried out in the Northern Passage, since less flying time would have to be devoted to convoy coverage. At this point, Iceland had switched from a base used mainly for defensive operations in protection of convoys to a base for offensive operations against submarines attempting to pass through the Northern Passage from bases in Norway and the Baltic. If Ottawa acceded to British requests, 162 (BR) would become an essential part of this offensive.

Slessor, in a message sent on 18 November, asked for Johnson's reaction to his proposal of 3 November, and repeated Slessor's intentions to have the Air Ministry request Air Force Headquarters in Ottawa for the allocation of a Canso squadron to Iceland if Johnson proved agreeable.⁴⁹ Johnson agreed, despite some hesitation. "Although I am reluctant", he told Slessor in a message sent the following day,

to send a squadron from the northwest Atlantic and its vile weather into the Northeast Atlantic with similarly vile weather I have recommended to Ottawa that a Canso amphibian squadron be made available to UK to operate under your operational control subject to recall at pleasure of Canadian government.⁵⁰

Johnson had made the recommendation to Ottawa on the same day, stating that "Eastern Air Command is over provided with long range anti-submarine squadrons to the extent of one Canso A squadron and one Catalina squadron", and recommended that 162 (BR) be offered to Coastal Command, while 117 (BR), which flew Catalinas and Cansos, be offered to the USN for operations, preferably from Bermuda. The squadrons were to be under the operational control of Coastal Command and the USN respectively, but were to

⁴⁸ Admiralty to B.A.D. Washington, signal MS.20902, 23 October 1943, PRO AIR 15/356, para. 6.

⁴⁹ Slessor to Johnson (Personal), signal A.977, 18 November 1943, DHist 181.002 (D 175).

⁵⁰ Johnson to Slessor (Personal), signal A.304, 19 November 1943, DHist 181.002 (D 175).

be subject to recall “during the pleasure of the Canadian government”. Johnson repeated his concerns about the weather in the northeast Atlantic, but conceded that “if efficient use of forces available so necessitates it [it] should be done.”⁵¹

On 20 November, Slessor contacted the Air Ministry and after a discussion of Coastal Command squadron dispositions that emphasized the lack of suitable anti-submarine squadrons in Iceland, recommended that the Ministry make an official request to Canada for the services of a Canso squadron. He also sent a personal message to Johnson thanking him for his co-operation and advising him that the Air Ministry would be making the official request to Ottawa. There was some debate within the Air Ministry about approaching the Canadians, as well as the conditions for the employment of 162 (BR) in Iceland, which included the need for the RCAF to provide its own maintenance personnel.⁵²

The official request was made by Air Marshal Sir Douglas C.S. Evill, Vice-Chief of the Air Staff (VCAS) in London, to Air Marshal L.S. Breadner, the Chief of the Air Staff (CAS) at RCAF Headquarters in Ottawa on 30 November. Evill omitted Slessor’s unofficial discussions with Johnson, at the former’s request.⁵³ The message discussed the lack of long-range aircraft in Iceland, and stated that:

in view of the new southern routing and the present U-boat trend you might be in a position to spare a Canso squadron for operations from Iceland. From our experience of the American Canso in Iceland such a squadron would have sufficient range to provide the shorter range cover for convoys routed northabout and would also be most valuable in the “moorings” area.⁵⁴

⁵¹ HQ EAC to AFHQ, signal A.299, 19 November 1943, DHist 181.002 (D 175).

⁵² Letter from HQ CC to Under Secretary of State (D. of Ops.(A.U.B.)), Air Ministry, 20 November 1943, PRO AIR 2/8418; Personal letter from Slessor to Johnson, 20 November 1943, PRO AIR 15/356; Letter from Deputy Director of Operations (A.U.B.) to Director of Policy, 22 November 1943, PRO AIR 2/8418.

⁵³ Letter from DCAS to VCAS, 26 November 1943, PRO AIR 2/8418.

⁵⁴ Evill to CAS, signal AX.236, 30 November 1943, PRO AIR 2/8418. The “American Canso” to which Evill refers is the PBY-5A. USN squadron VP-73 had operated such aircraft from Reykjavik from August 1941 to October 1942. It was replaced by VP-84 from September 1942 to August 1943. Hendrie, Flying Cats, 34-41. See Map 4 for the location of the “moorings” area.

Evill proposed that if the RCAF were to make a Canso squadron available, the squadron would be under the control of Coastal Command, but subject to recall by Canada when desired. Making a Canso squadron available would, Evill argued, “greatly assist us in disposing our forces to the greatest advantage.”⁵⁵

The request was submitted to the Minister of National Defence for Air for consideration “in connection with the re-organisation proposed for the Long Range squadrons on the East Coast.”⁵⁶ The Minister, after a meeting of the Cabinet War Committee on 1 December, replied to the CAS on the 3rd. Two Canso squadrons could either be diverted, at least temporarily, or disbanded. The War Committee agreed that one of the squadrons would be transferred to Iceland, as requested by the British, while the disposition of the other would be decided by the Minister.⁵⁷ On 6 December, the Air Ministry in Whitehall was informed by the RCAF that a Canso squadron would be made available by the Canadian government, “subject to immediate recall if [the] situation demanded.”⁵⁸ The Canso unit, identified as 162 (BR), would have fifteen Canso ‘A’ aircraft, and the RCAF would meet attrition and other aircraft requirements, including the provision of spare parts. Some 335 personnel, both aircrew and groundcrew, were on the squadron’s establishment. 162 (BR) would be able to arrive in Iceland by 15 January 1944, and the RCAF wanted confirmation of several questions: that the squadron’s destination was Reykjavik, that arrival on 15 January was suitable, and that “ordinary airbase facilities such as accommodation, messing, personnel, ground handling equipment, stores and maintenance buildings will be available.” Once these points had been

⁵⁵ Evill to CAS, 30 November 1943, PRO AIR 2/8418.

⁵⁶ Notes on *ibid.* See Douglas, The Creation of a National Air Force, 370-371, for a brief discussion of the reduction of EAC’s Canso strength.

⁵⁷ Letter from Minister of National Defence for Air to CAS, 3 December 1943, NAC, RG 24, vol. 5211, file H.Q.S.17-162-9, “No. 162 BR”. The other squadron was 117 (BR).

⁵⁸ HQ RCAF to Air Ministry, signal MS.23383, 6 December 1943, PRO AIR 2/8418.

confirmed, RCAF Headquarters suggested, the details could be arranged by Coastal Command and Eastern Air Command.⁵⁹

Provision of these facilities was not as straightforward as the Canadians assumed. The following day, Coastal Command discussed the RCAF's three questions. Arrival in Reykjavik on 15 January was acceptable, but some facilities would not be available. No domestic personnel, such as cooks, butchers, and batmen would be available, and ground equipment and spares for Canso 'A' aircraft were likewise not to be had, since Coastal Command did not operate the type. Coastal Command hoped that major maintenance would be carried out by EAC in Canada. Transport and drivers would, however, be available.⁶⁰ On 8 December, the Air Staff in Ottawa announced its decision. 162 (BR) was to prepare for movement to Iceland so as to arrive at Reykjavik by 15 January, while 117 (BR) was to be disbanded, its Cansos and Catalinas transferred to WAC in order to bring its BR units up to strength, as well as to provide Canso 'A's for No. 3 OTU in Patricia Bay, British Columbia. Personnel from 117 (BR) were to be used to bring 162 (BR) up to strength; the remainder were to be transferred to WAC in order to provide additional personnel for its Bomber Reconnaissance units.⁶¹ It appears that the main reason for 162's transfer to Iceland instead of being disbanded like 117 (BR) was its amphibious capability; many of 117 (BR)'s aircraft were flying boats, capable of operations only from water.

The following day, the Air Ministry sent its thanks to RCAF Headquarters for offering 162 (BR) for service in Iceland. The destination and time of arrival for the squadron, and base, staffing, spares and maintenance arrangements (or lack of them) were confirmed.⁶² The same day, Air Commodore Dawson, Director of Operations (Anti-U-Boat), wrote to Slessor, informing him that the RCAF would be sending 162 (BR) to

⁵⁹ *ibid.*

⁶⁰ Letter from D. of Ops. (A.U.B.) to DWO, 7 December 1943, PRO AIR 2/8418.

⁶¹ AMAS to AMO, 8 December 1943, NAC, RG 24, vol. 5211, file H.Q.S.17-162-9, "No 162 BR".

⁶² Air Ministry, Whitehall, to RCAF HQ, signal AX.983, 9 December 1943, PRO AIR 2/8418.

Iceland. Dawson explained the conditions of the agreement with the Canadians, and asked Slessor to arrange for the removal of 269 (GR) Squadron RAF, which 162 was replacing, prior to 15 January. As soon as official confirmation was received from the Canadians, Slessor was to make the detailed arrangements concerning the move directly with Eastern Air Command.⁶³

Canada sent its confirmation the following day, accepting the RAF's conditions, and suggesting that further details of the move be arranged directly between EAC and Coastal Command, although this message was apparently not received until the 21st.⁶⁴ There were a number of issues concerning 162 (BR)'s posting that had still to be decided in Canada. Among these were dental, postal, auxiliary, and record keeping services, and the provision of chaplains. It was decided that all of these services could best be provided by or dealt with in Canada. The issue of legal services, especially the right to convene courts-martial, however, was not completely resolved, and it would continue to plague the squadron for some time to come.⁶⁵ Another issue arising from the negotiations for the posting of 162 (BR) to Iceland was the question of jurisdiction and chain of command. On 9 December, RCAF Overseas Headquarters in London sought confirmation that 162 (BR) would not become an additional "Article 15 squadron," and stated that the "relationship to Overseas H.Q. and situation regarding pay, clothing, and replacement of personnel, etc., are involved."⁶⁶ Overseas Headquarters seems to have been annoyed that it was left out of

⁶³ Letter from D. Ops (AUB) to AOCinC Coastal Command, 9 December 1943, PRO AIR 15/356.

⁶⁴ AFHQ Ottawa to Air Ministry, Whitehall, signal MS.24251, 10 December 1943, PRO AIR 15/356.

⁶⁵ DAS Memorandum, 22 December 1943, DHist 181.006 (D312). This file contains considerable correspondence on the subject of the authority to convene courts-martial for members of 162 (BR). Its anomalous status as the only HWE squadron serving overseas meant that Privy Council orders covering disciplinary issues for overseas squadrons, which were intended to cover the Article 15 Squadrons (see below) serving overseas with the RAF, did not apply to 162 (BR).

⁶⁶ RCAF OS HQ, London, to CAS, AFHQ, Ottawa, signal A.496, 9 December, 1944, DHist 181.006 (D312). An Article 15 Squadron was one of the RCAF's overseas squadrons which was organized under Article 15 of the British Commonwealth Air Training Plan. Article 15 specified that ". . . pupils of Canada, Australia, and New Zealand shall, after training is completed, be

the process of assigning 162 (BR) to a new base. On 18 December, Air Marshal L.S. Breadner, AOCinC of the RCAF Overseas, sent an indignant message to AFHQ in Ottawa about the negotiations surrounding 162 (BR)'s movements. These had been initiated by the Air Ministry and had taken place with authorities in Canada. In future, it was stated, "headquarters staff [should] be instructed in . . . instances of this nature to refer the question here. Further ask Air Ministry to be so informed."⁶⁷ Ottawa's strong answer of 29 December defended its direct dealings with the Air Ministry. Breadner was told that 162 (BR)

is not repeat not an additional Article 15 squadron but is merely an EAC repeat EAC unit temporarily diverted to Iceland in support of Coastal Command A/S repeat A/S operations . . . squadron continues under administrative control of EAC repeat EAC though under functional control of Coastal Command. Under circumstances I [Power] consider it quite appropriate that negotiations were carried out direct between Air Ministry and RCAF Headquarters.⁶⁸

Earlier the same day, Breadner had been instructed not to send any RCAF Overseas personnel to 162 (BR) "as it would only lead to administrative confusion." The necessary arrangements for the provision of a chaplain, auxiliary services, dental and other services, Breadner was told, and as has already been seen, would be made from Canada.⁶⁹

On 23 December, the Air Ministry sent official confirmation to Coastal Command of 162 (BR)'s movement to Iceland. Coastal Command was henceforward to make detailed arrangements for the move directly with Eastern Air Command. These arrangements headed up a message from EAC to Coastal Command on 24 December,

identified with their respective Dominions, either by the method of organising Dominion units and formations or in some other way." The Canadian Article 15 squadrons came under the jurisdiction of RCAF Overseas HQ, so Breadner apparently sought clarification of 162 (BR)'s status in order to see if it came under his control.

⁶⁷ RCAF OS HQ, London, to AFHQ, Ottawa, signal A.659, 18 December 1943, DHist 181.006 (D312).

⁶⁸ Ottawa to RCAF OS HQ, London, signal MS.24293, 29 December 1943, DHist 181.006 (D312). Major C.G. Power was Minister of National Defence for Air until November of 1944, when he was replaced by General A.G.L. McNaughton. Why he would be sending messages after November of 1944 is not entirely clear.

⁶⁹ Ottawa to RCAF OS HQ, London, signal MS.24276, 29 December 1943, DHist 181.006 (D312).

describing the travel plans for 162 (BR), noting the trouble with obtaining sea transport, and asking for assistance in providing accommodations and messing until the ground echelon of the squadron arrived in Iceland. At this point, Coastal Command requested its Officer Commanding in Iceland to deal directly with EAC, since EAC had been asked to deal directly with Iceland in future communications.⁷⁰

While the final arrangements for 162 (BR)'s relocation were being made, the squadron was already preparing for its move to Reykjavik. On 7 December, the squadron received a signal from EAC notifying it of an overseas posting. The squadron's ORB recorded that there were "many guesses re destination but majority pleased by promise of action at last." The following day, Iceland was confirmed as the squadron's probable destination, which "cools the spirits slightly after rumours of the Azores and the tropics."⁷¹ Iceland was formally confirmed as the squadron's destination on 14 December when Eastern Air Command Movement Order No. 25 was issued. The order set forth the task for the squadron and stated that:

The 15 Canso A aircraft of No. 162(BR) Squadron, RCAF . . . are to proceed from RCAF Station, DARTMOUTH, on 3rd January, 1944, or as soon after as weather permits, with full aircrew and four ground crewmen in each aircraft . . . via RCAF Station, GOOSE BAY, LABRADOR, BLUIE WEST I, GREENLAND to REYKJAVIK, ICELAND. The officer commanding . . . is responsible that the 15 aircraft arrive at Reykjavik on or as soon after 15th January, 1944, as possible.⁷²

The aircraft were to be fully operationally equipped, with the exception of depth charges. The squadron was also to determine the amount of spares, ground handling equipment, and photographic equipment necessary for six months, and send this material to Reykjavik by

⁷⁰ Letter from Air Ministry, Whitehall, to HQCC, 22 December 1943, HQ EAC to HQ CC, signal A.38, 24 December 1943, HQ CC to Iceland, signal number unclear, 25 December 1943, PRO AIR 15/356.

⁷¹ 162 (BR) ORB, 7-8 December 1943. It is an interesting comment on the lack of U-boat activity in Canadian waters that the squadron's personnel considered a posting overseas as a chance to "see action". A similar remark had been made in the ORB on 24 September when six Cansos were sent on detachment to Stephenville, Newfoundland. The rumour of an impending move to the Azores had some basis in fact, since, as seen above, it had been suggested that the squadron be sent to the Azores, and that 117 (BR) be sent to Bermuda.

⁷² "Eastern Air Command Movement Order No. 25", 14 December 1943, 1, DHist 181.009 (D274).

ship. The squadron's establishment of personnel was also to be complete, and personnel other than aircrew and groundcrew travelling by aircraft to Reykjavik were to be sent by sea along with the squadron's equipment, although in the event, few were. Sports equipment, games, and "personal comforts" were also to be sent to Iceland. 162 (BR)'s administrative status during its posting was also clarified. It was to come under the control of the AOCinC, Coastal Command, RAF, for "operations, accommodation, rations, and discipline, but for all other matters is to remain under the control of the Air Officer Commanding-in-Chief, Eastern Air Command, Royal Canadian Air Force."⁷³

Just over a week later, on 23 December, Air Force Headquarters in Ottawa contacted EAC about the squadron's aircraft. The necessary spares for the squadron were being obtained from Vickers in Montreal, and as a result Ottawa considered it "essential" that only aircraft manufactured by Vickers be transferred to Iceland, since some parts on Vickers and Boeing built Cansos might not be interchangeable.⁷⁴ Since it had been confirmed as of 9 December that the squadron would be moving to Iceland, and the move had been officially under discussion since 30 November, it seems somewhat unusual that no-one appears to have given this subject any thought until then. EAC replied on the following day, advising Ottawa that since special installations such as radar and nose gun modifications were installed in 162 (BR)'s aircraft, it was not possible to substitute Vickers built aircraft for their Boeing counterparts at such a late date. Furthermore, spares for Boeing built aircraft had been shipped from Moncton to Iceland the day before.⁷⁵ AFHQ, after some internal discussion, eventually decided that EAC should be ordered to exchange the Boeing Cansos in Iceland for Vickers Cansos as soon as the latter were fully equipped,

⁷³ *ibid.*

⁷⁴ AFHQ to EAC, signal Q.6886, 23 December 1943, NAC RG 24, vol. 5396, file HQS.60-3-12 vol.5, "PBY Flying Boats".

⁷⁵ EAC to AFHQ, signal Q.477, 24 December 1943, NAC RG 24, vol. 5396, file HQS.60-3-12 vol. 5, "PBY Flying Boats".

since Vickers was by then the only source for Canso spares.⁷⁶ On 5 January, the CAS notified EAC about the transfer of Boeing Cansos to Iceland. The Air Staff, after the discussion noted above, had agreed that Boeing built aircraft would be exchanged for Vickers built Cansos as soon as the latter were fully equipped. The letter also listed items peculiar to the Canso "A" that would have to be provided by the RCAF, since neither the RAF nor American forces could provide them, even in case of an emergency.⁷⁷

The squadron did have two of its aircraft replaced prior to its departure, however. On 19 December Canso "A"s 9841 and 9842 were delivered to the squadron by members of 161 (BR). They replaced 9749 and 9750, which had served with the squadron since its initial days as 10 (BR) Detachment in April 1942. Canso "A" 9749 was sent to Scoudouc for overhaul, while 9750 was transferred to 161 (BR). The two new aircraft were both built by Vickers, which was by this time the only producer of Canso "A"s in Canada. Since 9749 was due for overhaul and 9750 had only some 100 flying hours left before a complete overhaul would be required, it made sense to leave the aircraft in Canada since the proper service facilities for these overhauls would be unavailable in Iceland.⁷⁸

The squadron's aircraft received several modifications prior to the move to Iceland. On 11 December, a party arrived from Number 4 Repair Depot (RD), Scoudouc, New Brunswick, to install Mark III IFF (Identification Friend or Foe) in the Cansos. Rear-facing mirror cameras that took a series of photographs at regular intervals during an attack

⁷⁶ Notes from DPA to D/AMAS Ops. and from D/AMAS Ops. to DPA on *ibid.* Boeing of Canada had delivered its last Canso "A" in July of 1943. By December 1943 they were building the PB2B-1 version of the Catalina for the RAF and other Allied air forces. The Canso "A"s delivered by Boeing had been assembled from parts delivered from Consolidated Aircraft Corporation's San Diego plant, which meant that Boeing's Vancouver plant could not guarantee a supply of spares for the aircraft it had delivered, while Canadian Vickers, which was still producing the Canso "A", could. Since the parts for the two manufacturers' aircraft were not necessarily interchangeable, Canadian Vickers aircraft were the logical choice for service in Iceland. W.E. Scarborough, PBY Catalina in action, (Carleton TX: Squadron/Signal Publications, 1983), 50.

⁷⁷ Letter from CAS to AOCinC, EAC, 5 January 1944, NAC RG 24, vol. 5396, file HQS.60-3-12 vol. 5, "PBY Flying Boats".

⁷⁸ 162 (BR) ORB, 19 December 1943, Summary, December 1943, Scarborough, PBY Catalina in action, 50.

were also fitted, and the aircrafts' ailerons were modified. On 9 December, an armament party composed of an officer and sixty airmen arrived to install twin machine guns in the noses of the aircraft, an essential modification for the aircraft heading to Iceland. The need for increased forward-firing armament was the result of the U-boat tactic of remaining on the surface to fight back against attacking aircraft which had begun in early April of 1943. From mid-June of that year, no U-boat was allowed to put to sea without an increased armament of at least two 20mm anti-aircraft guns.⁷⁹ By August, heavier anti-aircraft armament on all U-boats leaving bases in the Bay of Biscay was mandated by Dönitz, and it was expected that most U-boats would be equipped with two of the twin 20mm weapons by September. The boats of Group *Leuthen* had all received improved anti-aircraft armament, which had caused problems for some of the Liberator crews providing cover for ONS 18 and ON 202, although EAC aircraft had been experiencing this new U-boat tactic for some time before their encounter with *Leuthen*. On 4 May 1943, a Canso of 5 (BR) had encountered heavy anti-aircraft fire from a U-boat, probably *U-438*, that had chosen to fight back on the surface. While the plane was not damaged, the U-boat was not sunk, and the post-attack report noted the dangers of A/A fire to the aircraft.⁸⁰ By remaining on the surface in the presence of an aircraft and fighting back, the U-boat had avoided destruction. By arming the aircraft more heavily, the anti-aircraft crews on the submarine might be

⁷⁹ The mirror camera not only recorded details of the U-boat being attacked, but allowed for a more accurate assessment of the results of the attack. 162 (BR) ORB, 9-15 December 1943, Summary, December 1943; C.H. Waddington, O.R. in World War 2: Operational Research against the U-boat, (London: Elek Science, 1973), 181; Samuel Eliot Morison, History of United States Naval Operations in World War II, Volume X: The Atlantic Battle Won, May 1943-May 1945 (Boston: Little, Brown and Co., 1968), 90; Eberhard Rössler, The U-boat: The evolution and technical history of German submarines (London: Arms and Armour Press, 1981), 188. See pp. 188-195 of this book for a concise illustrated technical history of the various anti-aircraft installations on U-boats.

⁸⁰ Liberator L/10 was damaged by fire from *U-270*, and Douglas notes that in the attacks made on U-boats "there seems to have been a tendency, no doubt exaggerated by the U-boats' 20mm quad anti-aircraft cannon, to come in too high on the first run". Hessler, The U-Boat War in the Atlantic, III, 4-5; Douglas, The Creation of a National Air Force, 564-565, 553. 5 (BR) was providing coverage for ONS 5 at the time.

suppressed or eliminated. At the very least, the volume of anti-aircraft fire might be reduced, giving the aircraft a greater chance of survival and of making a successful attack.

By early July of 1943, the RCAF was testing an experimental gun installation in its Cansos in order to counter the new German tactic of fighting it out on the surface. The installation initially consisted of two .30 calibre machine guns in ball socket mounts in the bomb aimer's window in the nose of the aircraft.⁸¹ Modifications were made in order to increase the freedom of movement of the guns, and .303 Browning machine guns were substituted for the initial .30 calibre weapons.⁸² Although the modified mounting allowed increased freedom of movement for the weapons, in steep dives the window space did not permit the target to be sighted sufficiently far ahead to make full use of the guns. The installation of additional windows for the bomb aimer was recommended, but according to Bomber Reconnaissance Operations at Eastern Air Command,

The prime consideration at present is to equip all Canso aircraft immediately with twin front guns. This is necessitated by a change in tactics of the U-Boats, namely to remain surfaced and fire on approaching aircraft. The modifications as presently designed should be incorporated at units immediately and not held up for the additional window.⁸³

Other problems held up the modifications, however. On 20 September, A/V/M Heakes, AOC No. 1 Group, gave "the highest priority possible" to the installation of the twin gun mounting in Cansos in Newfoundland. A shortage of parts, as well as some installation difficulties, led to only four aircraft in No. 1 Group being modified in the first

⁸¹ Memorandum from PD5 to D/DAD, "Canso Aircraft - Experimental Flexible Gun Installation and A.S.D. Blister," 3 July 1943, NAC RG 24, vol.5396, file HQS.60-3-12 vol.5, "PBYP Flying Boats".

⁸² *ibid.* ; Memorandum from DAE for AMAE to AMAS/DOR, "Canso Aircraft - Experimental Flexible Gun Installation," 7 July 1943, NAC RG 24, vol.5396, file HQS.60-3-12 vol.5, "PBYP Flying Boats".

⁸³ Memorandum from BR Ops to AMAE D/DAD 1, "Modifications to Canso Aircraft - Free Gun Installation in the Bow," 7 July 1943, NAC RG 24, vol.5396, file HQS.60-3-12 vol.5, "PBYP Flying Boats". The terms "nose" and "bow" both appear to have been used when referring to the Canso "A". The aircraft's amphibious capability creates some uncertainty in this area, since "nose" is the term used for land-based aircraft, while flying boats generally used "bow".

month.⁸⁴ In November, the installation was modified yet again, this time by the provision of flexible chutes to feed ammunition to the guns, instead of having the magazines mounted directly on the weapons. It was noted at this time that “installation is proceeding satisfactorily. Experience to date has shown, however, that it is necessary to hand tailor detail fittings for nearly every aircraft.”⁸⁵

The RCAF apparently thought the twin gun installation sufficient to deal with U-boat anti-aircraft fire. Other air forces did not. No. 10 Squadron, Royal Australian Air Force, which flew Sunderlands as part of Coastal Command, found the armament of its aircraft to be inadequate against U-boats “fighting it out” on the surface. The Sunderland III, which the squadron operated, already had twin .303s in a power operated bow turret, which gave them greater freedom of action, as well as providing much better visibility for the gunner than the twin-gun installation in the Canso. The Australian response to the loss of one of their Sunderlands in an attack on *U-454* on 1 August 1943 was to fit their Sunderlands with four additional fixed .303 machine guns, mounted in the bows of the aircraft and fired by the pilot. This installation proved its worth on 8 January 1944, when the guns of one of the squadron’s Sunderlands knocked out the anti-aircraft gunners on *U-426*, which was then sunk by the attacking aircraft. A forward-firing fixed-gun installation was standardized on the Sunderland, presumably as a result of its effectiveness against U-boat anti-aircraft crews.⁸⁶ Other Coastal Command aircraft received increased frontal armament to deal with U-boat A/A fire, although the type and disposition of armament

⁸⁴ Letter from AOC No. 1 Group to DND for Air, Ottawa, “Canso AFTEC E1/40/54 and E1/40/57,” 18 October 1943, NAC RG 24, vol.5396, file HQS.60-3-12 vol.5 “PBY Flying Boats”, 1.

⁸⁵ Letter from AOCinC, EAC, to DND for Air, Ottawa, “Catalina/Canso/Canso “A” - T.E.O. E.1/40/57 - Twin Bow Gun Installation,” 26 November 1943, NAC RG 24, vol.5396, file HQS.60-3-12 vol.5, “PBY Flying Boats”.

⁸⁶ Denis Richards and Hilary St. George Saunders, Royal Air Force 1939-1945, Volume 3: The Fight is Won, (London: HMSO, 1975), 34, 49; William Green, War Planes of the Second World War: Flying Boats, Volume Five, (London: MacDonald, 1969), 99-100.

varied from squadron to squadron.⁸⁷ The USN's "Black Cats", which flew nighttime anti-shipping missions in the Pacific using Catalinas, also saw a need for increased frontal firepower. The field modification consisted of four fixed .50 calibre machine guns mounted in the bow of the aircraft, fired by the pilot, while the bow gunner could still use the flexible .30 calibre gun in the bow turret.⁸⁸

Some misgivings about the adequacy of the new armament for the Canso were expressed on 15 November 1943, when EAC passed on a suggestion to Ottawa from No. 1 Group that "more powerful offensive armament should be installed in Canso Aircraft".⁸⁹ In order to outrange the anti-aircraft armament of the U-boats, 37mm or 40mm cannon were suggested. EAC agreed that

Canso aircraft with two forward firing .303" machine guns are outgunned considerably by the heavier A/A armament currently carried on U-boats. However, it is felt that the need is for more adequate anti-personnel weapons and not for an additional anti-U-boat weapon such as the 37 or 40mm cannon.⁹⁰

EAC suggested the installation of two 20mm cannon to fulfil this task, but the CAS doubted whether fixed guns with a comparatively slow rate of fire would be useful anti-personnel weapons. Ottawa believed that the best answer would be free heavy calibre guns, but held out little hope for such an installation being possible in the Canso. Ottawa

⁸⁷ "Armament in 1943," Coastal Command Review, v. II, no. 8 (December 1943), 30. There was a special section of the Anti-U-Boat Division at Coastal Command that studied the use and effectiveness of this type of armament. Air Ministry, "The RAF in Maritime War," IV, 472. Peyton-Ward notes that "In the hands of a well trained crew they [machine guns] not only reduced the accuracy and volume of a U-boat's flak on the attacking run-in but inflicted many casualties and sometimes entirely smothered such fire." *ibid*.

⁸⁸ Roscoe Creed, PBY: The Catalina Flying Boat, (Annapolis: Naval Institute Press, 1985), 166.

⁸⁹ Letter from AOCinC, EAC, to DND for Air, Ottawa, "Canso Aircraft - Front Gun Armament", 15 November 1943, NAC RG 24, vol. 5396, file HQS.60-3-12 vol.5, "PBY Flying Boats". The use of cannon against U-boats, albeit in a different aircraft and for a different purpose, had in fact been suggested even before U-boats had begun to fight back on the surface. In August of 1942, a report from the Test and Development Establishment at Rockcliffe had suggested mounting 20mm cannon in the nose of a Hudson in order to prevent or delay the crash diving of a submarine, but it appears that no action was taken on this suggestion. "Report on Experimental Work, Test and Development Establishment, RCAF Station Rockcliffe Ontario, Report No. 513 on Pattern of Bombs," 15 August 1943, NAC RG 24, vol. 5357, file HQS.44-3-24, "Secret Devices - Development of"

⁹⁰ Letter from AOCinC, EAC, to DND for Air, Ottawa, 15 November 1943.

did not wish to “close this subject finally”, however, and welcomed any further suggestions or comments about armament for the Canso.⁹¹ None were forthcoming. The inadequate frontal armament of the Canso was to cost 162 (BR) dearly in its forthcoming encounters with U-boats.

The upgrading of the squadron’s aircraft was completed by 15 December, when the armament party finished installing the nose guns in the Cansos. Squadron members posted overseas were given embarkation leave until 30 December, while those remaining in Canada stayed on the base. In the meantime, additional personnel arrived for the squadron from other EAC bases, and as mentioned above, two new Canso “A”s arrived to replace two of the squadron’s oldest aircraft. All flying had come to an end on 12 December, and did not resume until the return of the aircrew and the final preparations for the trip to Iceland. New Year’s Eve was celebrated in the various messes at RCAF Station Dartmouth. The ORB noted that “All squadron personnel attended and really enjoyed themselves”⁹² and that

the celebration for New Years [sic] and our posting was certainly put over with a BANG! The general feeling was that this may be our last New Year in Canada for a few years. The morning parade was cancelled and later in the day, the noon-hour parade was also, as there was no news available regarding our movement.⁹³

Despite the seeming inactivity of New Year’s Day, the squadron was fully occupied with the move to Iceland. On 2 January, the loading of the RCAF Marine Craft *Eskimo* with equipment that would be needed immediately in Iceland, as well as squadron members’ heavy baggage, began. The squadron’s aircraft were also prepared for departure. Compasses were swung, a thorough cleaning of each aircraft was carried out, and spares such as oil coolers, tires, spark plugs and tools were loaded on board. Each aircraft carried

⁹¹ Letter from CAS to AOCinC, EAC, 24 November, 1943, NAC RG 24, vol.5396, file HQS.60-3-12 vol. 5, “PBY Flying Boat”.

⁹² 162 (BR) ORB, 31 December 1943.

⁹³ *ibid.*, Dartmouth, 1 January 1944. The ORB for this month is divided into sections dealing with the squadron’s activities at various bases along the route from Dartmouth to Reykjavik, and this division will be noted in the footnotes where it is important.

a complete crew of eight, along with four groundcrew as passengers. All twelve carried forty pounds of baggage each, and when the weight of the spares and the oil and fuel that had to be carried were calculated, it was found that the Cansos were very close to the maximum permissible all-up weight.⁹⁴

On 4 January, four aircraft left Dartmouth on the first stage of the trip to Reykjavik. Canso "A"s 9759, 9841, 9809, and 9768 arrived in Goose Bay later the same day. Five aircraft, 9808, 9754, 9842, 9766, and 9779, made the trip the following day, while 9841 and 9768, which had arrived in Goose Bay on the 4th, left for Bluie West 1 (BW1) in Greenland. The first made a successful trip, but 9768 suffered from engine trouble immediately after taking off and was forced to return to base. The pilot's vision was obscured by fog, and he made a landing at an angle to the runway that broke the aircraft's nose gear when it ran into a snowbank.⁹⁵ The damage was repairable, but the troubles experienced with the aircraft's engines were the first manifestation of a series of differing problems that would dog the squadron throughout the trip to Iceland and afterwards. The engines in the Cansos did not take kindly to the cold weather, which averaged around -20° C. Troubles with the spark plugs, although not entirely attributable to the cold weather, affected many aircraft. The engines would pass preliminary checks, but would fail to deliver full power on takeoff, which would delay the aircraft's departure until the problem was solved. Changing the spark plugs was often effective, but there was no guarantee that it would work, and in any case considerable time was taken up by this procedure.⁹⁶

⁹⁴ *ibid.*, 2-3 January 1944, January 1944, Appendix B, "Narration", 1. The EAC Marine Squadron had been formed in June 1943 from vessels and crews previously attached to individual RCAF stations. Douglas, The Creation of a National Air Force, 394.

⁹⁵ 162 (BR) ORB, 4-5 January 1944, January 1944, Appendix B, "Narration", 6; RCAF Station Goose Bay ORB, 4-5 January 1944. The nose gear was replaced with the unit from a 116 (BR) aircraft at Goose Bay.

⁹⁶ 162 (BR) ORB, January 1944, Appendix B, "Narration", 3; Harvey H. Lippincott, "Parallel Development with PBY: The R-1830 Twin Wasp Engine," AAHS Journal, 16:2 (Summer 1971), 118-120. The squadron's experience of engine trouble in cold weather is at variance with the experience of some American pilots. William E. Scarborough, "The Consolidated PBY, Part II," AAHS Journal, 16:2 (Summer 1971), 122.

The other major problem encountered by the squadron was the failure of oil coolers, which often burst on startup due to the oil's congealing in the cold weather. This problem, unlike the difficulties with spark plugs, was solved relatively simply by a change in procedures when shutting down the aircraft. Fuel tanks were also a problem. Many of them suffered from leaks due to loose rivets and by malfunctioning fuel dump valves, a problem that was mainly caused by the cold.⁹⁷ There were also temporary inflight difficulties caused by the cold. On 18 January, F/L Dale and his crew in 9769 had a particularly uncomfortable trip from Goose Bay to BW1. Flying at 15,000 feet due to clouds, the temperature dropped to -50° C. Almost all of the aircraft's gyroscopic instruments failed, and the fluid in the autopilot servomechanisms became so viscous that it was very difficult to move the aircraft's controls. The compass also developed a large bubble in its fluid, which affected its accuracy. Dale's flight was exceptional, but most of the aircraft encountered some difficulties due to the cold and the lack of oxygen equipment in the aircraft that turned even simple duties into complicated chores. Although the aircraft were fitted with heaters, in many cases the cold weather prevented them from operating properly. When the heaters did work, they affected the compasses in the aircraft quite severely, with deviations of up to 30° occurring when they were switched on. The squadron's ORB simply stated that "the 'Damned' things won't work!"⁹⁸

⁹⁷162 (BR) ORB, January 1944, Appendix B, "Narration", 3, 8. Before the development of modern multigrade lubricating oils, oil in aircraft engines that were shut down in cold weather was diluted with aviation fuel in order to keep it from congealing. The squadron's normal procedure prior to the trip to Iceland had been to dilute the oil after the engines were shut down, but in bases like Goose Bay and BW1, the oil cooled so quickly that it congealed inside the oil coolers almost as soon as the engines were shut off. When the engines were next started up, the oil coolers would be blocked and the oil attempting to circulate would burst them. The problem was solved by diluting the oil prior to shutting down the engines. It should be noted that the squadron had previously encountered problems with its oil coolers in cold weather during its detached service at Mont Joli, but that they were not as severe as those encountered on the trip to Iceland. The problem with fuel tanks affected both Boeing and Vickers built aircraft, and does not appear to have any connection to the problems experienced with the paint used by Boeing on the interior of fuel tanks that grounded the squadron's aircraft in March and April 1943.

⁹⁸ *ibid.*, 4, 5, 7-8; Appendix A, "Navigator's Report", 1. The heaters used a gasoline engine in the fuselage that heated air and blew it through tubes to the various compartments, where small electrical fans at the end of the tubes circulated the warmed air. The large compass deviations

There were also problems that were not connected to the aircraft at all. The route from Dartmouth to Reykjavik covered swaths of inhospitable territory and ocean, especially from Goose Bay onwards, and the January weather was an additional hindrance. Time and time again, flights were delayed by bad weather, either at a flight's point of origin or at its destination, or at both. The location of the American base at Bluie West 1 in Greenland was also a problem that the squadron had to deal with. The airfield had been established by June 1942 at Narsarssuaq, in southern Greenland (see Map 2). It lay roughly midway between Goose Bay and Reykjavik, at a distance of about 775 miles from either base.⁹⁹ However, BW1 had been established at the head of 50-mile-long Tunugdliarfik Fjord, from necessity instead of by choice. The difficulties presented by the base's location meant that a briefing film was specially prepared for pilots flying from Goose Bay to Bluie West 1. Low cloud often forced aircraft approaching the base to fly the fifty miles of the fjord at less than a thousand feet of altitude, while the need to navigate down the fjord and around the southern tip of Greenland limited the squadron's departures to the few hours of daylight at BW1's northern latitude. Flying out and around Greenland's southern tip was preferable to crossing the central icecap, which required flying at an altitude of at least 12,000 feet. The trip from there to Iceland was relatively straightforward, but the need to leave BW1 during daylight hours ensured that the Cansos arrived at Reykjavik after dark.¹⁰⁰

were probably the result of magnetic fields set up by the fan motors in the heating system as well as the magnetic fields set up by the wiring system, which presumably used the standard American ground return system of wiring, where the metal structure of the aircraft was used for all of its negative circuits. For details of the effects of this system in the Consolidated Liberator, whose heating system would probably have been similar to that of the Canso, which was another Consolidated Aircraft design, see Brian Johnson and Terry Heffernan, Boscombe Down, 1939-1945: A Most Secret Place, (London: Jane's 1982), 96-97. A British investigation of the Catalina, undertaken in 1941, warned of the possibility that "as in the case of the Liberators, the electrical gear driving the fans may interfere with the compass." S/L R.H. Winfield, "Factors Influencing Onset and Production of Fatigue in Catalina Flying Board [sic] Crews," 3, 1 September 1941, DHist 90/400.

⁹⁹ Wesley Frank Craven and James Lea Cate, The Army Air Forces in World War II, Volume One: Plans and Early Operations, January 1939 to August 1942, (Chicago: University of Chicago Press, 1948), 343-346.

¹⁰⁰ 162 (BR) ORB, January 1944, Appendix A, "Navigator's Report", 1-2.

On 6 January, snow in Dartmouth prevented the departure of any more aircraft for Goose Bay, but three aircraft, 9759, 9779, and 9766, left the latter base for Greenland. The third aircraft experienced some apparently minor engine problems during the flight, but on attempting to land at BW1, the main landing gear only descended partway, necessitating a manual lowering of the gear. Hydraulic pressure had also dropped to zero when the landing gear were lowered, so the hand pump for the hydraulic system had to be used to provide enough pressure to operate the brakes. Inspection of the starboard engine revealed that the oil filter had collapsed, the auxiliary drives for the engine tachometer and the hydraulic pump had failed due to lack of lubrication, and that chips of metal had been distributed throughout the engine, necessitating an engine change. EAC gave permission for the use of an American spare engine at BW1, and the change was successfully made with the assistance of American personnel on the base.¹⁰¹

The first of the squadron's Cansos arrived in Iceland on 6 January; 9841, carrying F/O Hildebrand and crew, landed at the airport in Reykjavik at 1855 GMT after a flight lasting slightly over seven hours. The following day, four aircraft left Dartmouth for Goose Bay. Cansos 9769, 9755, and 9767 arrived in Goose Bay, but 9770 was diverted to the American base at Mingan, on the north shore of the St. Lawrence, due to bad weather at Goose Bay. Two aircraft, 9779 and 9759, left Blue West 1 for Reykjavik the same day, both arriving safely. Meanwhile, in Dartmouth, there was some concern because no information was forthcoming on the ship that was to transport the remainder of the squadron's groundcrew to Iceland. On 8 January, the personnel in Dartmouth were still awaiting steamer transportation to Reykjavik. The only squadron aircraft to fly that day was 9770, which left Mingan for Goose Bay.¹⁰² In Reykjavik, however, an event that was to affect the squadron's future in Iceland was taking place. The squadron ORB notes that

¹⁰¹ *ibid.*, Appendix B, "Narration", 6.

¹⁰² *ibid.*, 6-8 January 1944.

Air Vice Marshal Curtis, RCAF, accompanied by the Station Commander, RAF Station Reykjavik, Iceland, Group Captain Moreton, inspected the quarters of Camp Corbett where personnel of 162 Squadron are presently quartered. The impression was not a favourable one. It is felt that the subsequent move of this Squadron from Camp Corbett to Camp Kwitchebelligiakin, the former [United States] Navy Air Facilities Base, was a direct result of this inspection.¹⁰³

While the squadron would still be operating from Reykjavik, it was now to take over American base facilities instead of the portion of the RAF base that they had apparently been allocated.

None of the squadron's aircraft were airborne on 9 January; bad weather in Greenland prevented any aircraft from leaving either Goose Bay or BW1. In Dartmouth, loading of another RCAF Marine Craft, the *Beaver*, began. The 600-ton *Beaver*, one of four ships used for supply and salvage work, was the largest vessel in EAC's Marine Squadron. Canteen supplies such as beer and candy were loaded on board, as was additional equipment. There was still no news of steamship transportation for the squadron's groundcrew in Dartmouth on the following day, and bad weather in Greenland again prevented any flights by squadron aircraft. On 11 January, the RCAF *Eskimo* sailed from Dartmouth for Reykjavik via Saint John's, Newfoundland. LAC F.W. Jones, a member of the squadron's groundcrew, made the trip by sea due to an ear ailment that prevented him from flying, while F/O D.C. Crowe apparently made the trip on board the *Eskimo* as a navigator. News also arrived in Dartmouth that since no ships were available to transport squadron personnel to Reykjavik, the movement would be made by aircraft. Douglas Dakotas of 164 (Transport) Squadron, RCAF, were to fly the groundcrew, divided into flights of nineteen, to Gander. From there, Liberators of 10 (BR) would fly them directly to Reykjavik. The flights that included maintenance personnel, chefs, general duty (GD), and equipment assistants were given priority for departure.¹⁰⁴

¹⁰³ *ibid.*, Reykjavik, 8 January 1944.

¹⁰⁴ "Eastern Air Command Operation Order No. 7", 8 January 1944, DHist 181.009 (D274); Douglas, The Creation of a National Air Force, 394.

The aircraft remaining in Goose Bay were unable to fly to Greenland on the 11th or the 12th. The weather at BW1 had cleared, but a weather front moving through Labrador prevented the aircraft from moving out. On 13 January, the last of the squadron's aircraft left Dartmouth. Canso "A" 9765, carrying W/C Chapman and crew took off for Goose Bay. In addition to supervising the squadron's relocation, Chapman had been delayed by persistent leaks in the aircraft's gasoline tanks, a problem that affected many of the squadron's aircraft.¹⁰⁵ The following day saw considerable progress in the squadron's move to Reykjavik. The first four flights of personnel were ferried by 164 Squadron to Gander, and eight Canso "A"s, 9768, 9754, 9808, 9809, 9842, 9770, 9765, and 9755 made the flight from Goose Bay to Greenland. On the 15th, the eight Cansos that had arrived at BW1 the previous day left for Reykjavik, but 9765, with W/C Chapman and crew, suffered engine trouble after takeoff and returned to base. It was found that the auxiliary drives on the port engine had not been receiving lubrication due to a blown gasket on a high pressure oil line. Similar problems had occurred with Canso 9766 during its flight from Goose Bay to BW1 on the 7th. In both cases, the engine had to be replaced. Canso "A" 9810 also developed a similar problem, but it was detected by an engine check before any damage was done.¹⁰⁶

Weather again prevented flying on 16 January. The persistent problems with the weather led the ORB to exclaim "What a time of year to try to fly in this country. If it isn't closed in here it is closed in somewhere else."¹⁰⁷ The next day, weather again prevented any of the personnel remaining in Dartmouth from making the flight to Gander, while 164's Dakotas were grounded at Moncton awaiting good weather. In Goose Bay, three of the squadron's Cansos, 9767, 9769, and 9810, were grounded with gas line trouble, but

¹⁰⁵ 162 (BR) ORB, 9-13 January 1944; January 1944, Appendix B, "Narration", 2, 8. Many of the gas tank leaks were caused by loose rivets and by problems with the dump valves. Cold weather seems to have been the major cause of the leaks.

¹⁰⁶ *ibid.*, 14-15 January 1944; January 1944, Appendix B, "Narration", 8.

¹⁰⁷ *ibid.*, Goose Bay, 16 January 1944.

were able to make the flight to BW1 the following day, when F/L Dale and crew in 9769 experienced the uncomfortable flight described above. Four Cansos were in the air on the 23rd, flying from BW1 to Reykjavik. Wing Commander Chapman had exchanged aircraft with F/O Cooke so that the former could travel to Reykjavik, where he was needed. Chapman and his crew took over 9810, and they were accompanied by 9769, 9767, and 9766. F/L Dale and his crew in 9769 landed at Meeks Field (at Keflavik) instead of Reykjavik, where the other three Cansos made their landings. The aircraft made the short hop to Reykjavik the following day. The RCAF marine craft *Eskimo*, which had left Dartmouth on the 11th, was sighted by 9754 while on a local flight and was given bearings by the aircraft, and arrived in Reykjavik two days later, having taken two weeks to make the trip. The last of the squadron's aircraft, Canso "A" 9765, which had required an engine change, finally arrived at Reykjavik on 31 January with F/O T.C. Cooke and crew.¹⁰⁸ Due to problems with aircraft and the weather, this was some two weeks later than had been expected when the move was planned.

Moving personnel to Iceland remained a problem. The remaining flights of personnel were still in Dartmouth on the 20th, awaiting transport to Gander, but despite statements to the contrary in 162 (BR)'s ORB, the four flights of personnel who had left Dartmouth for Gander were already in Reykjavik. Four Liberators had flown to Reykjavik with members of 162 on the 16th, but the aircraft had yet to return to Gander.¹⁰⁹ In any case, the lack of accommodations at Gander prevented any additional transport flights to the base from Dartmouth. On 20 January EAC proposed a change of transfer points from Gander to Goose Bay, and on the 22nd, with 165 personnel remaining in Dartmouth, the squadron's movement orders were amended accordingly.¹¹⁰ On the 23rd, two Dakotas flew fifty-two personnel to Goose Bay in a "very cold" but uneventful trip. The same day,

¹⁰⁸ *ibid.*, 20-31 January 1944.

¹⁰⁹ *ibid.*, 17-19 January 1944; 10 (BR) ORB, 16 January 1944; HQ EAC to Goose Bay, signal A.364, 20 January 1944, DHist 181.009 (D274).

¹¹⁰ *ibid.*; HQ EAC to 162 Squadron, signal A.6, 22 January 1944, DHist 181.009 (D274).

two of 10 (BR)'s Liberators returned to Gander, and by 25 January they began leaving for Goose Bay to ferry personnel to Iceland.¹¹¹ On the 24th the last of the squadron's personnel left Dartmouth, when five Dakotas of 164 (T) flew them to Goose Bay. The change of transfer points from Gander to Goose Bay, although necessary, was not without its problems. Like Gander, Goose Bay found that it was hard pressed to accommodate the influx of personnel. On 30 January, the ORB for Goose Bay noted that "with the arrival of 166 personnel of 162 Squadron during the latter part of the week, all completed Barrack Blocks are taxed to capacity."¹¹² None of 10 (BR)'s aircraft arrived in Goose Bay until 27 January, and in the meantime 162 (BR)'s tradesmen and general duties personnel were loaned to the station to help out with duties and keep the personnel occupied. A bowling league was organized on the 26th as a means of entertaining the squadron's personnel.

On 27 January the flight to Reykjavik was cancelled due to weather, and on the 28th the plane actually took off, but was recalled due to weather conditions in Reykjavik when it was three quarters of the way to Greenland. The persistence of bad weather was noted in the ORB on the 29th. "This continual bad weather", it stated, "makes everyone wonder what manner of country is Iceland."¹¹³ Since persistent efforts to fly #5 flight of personnel to Iceland had failed, superstition led to the readying of #6 flight to make the trip, but the substitution proved unsuccessful. None of the personnel in Goose Bay made the trip to Reykjavik until early February, and some did not arrive until March 31. It had originally been planned to move them by sea, but the necessary shipping was unavailable, and EAC had to turn to air transportation. This was the first time that a fully operational squadron had been moved overseas by air, and the RCAF's shortcomings in long range transportation were highlighted. Liberators from 10 (BR) had to be pressed into service as

¹¹¹ 10 (BR) ORB, 23, 25 January 1944.

¹¹² Goose Bay ORB, 30 January 1944. The discrepancy in numbers of personnel appears to have been a simple error.

¹¹³ 162 (BR) ORB, 24-28 January; 10 (BR) ORB, 26, 27 January 1944; 162 (BR) ORB, Goose Bay, 29 January 1944.

personnel transports because transport versions of the Liberator would not enter service with 168 (Heavy Transport) Squadron until October 1944, and 164's Dakotas were not allowed to make the flights to Reykjavik due to concerns about long overwater flights and the unit's heavy transport commitments in Canada. When operational necessity drew the Liberators back to their usual duty as anti-submarine aircraft, the groundcrew remaining in Goose Bay were forced to rely upon the RAF for transport to Iceland.¹¹⁴

By the end of January, 162 (BR) and other Canadian squadrons had moved 15 Canso "A"s, 15 crews totalling 120 aircrew, and 174 groundcrew to Reykjavik. There were still, however, the personnel waiting in Goose Bay for transportation, and their absence was to interfere with the squadron's operations from Reykjavik in the months to come.¹¹⁵ The five months from September of 1943 to January of 1944 had seen the squadron operate from four new bases and send detachments to two others without ever having the time to establish themselves in one place. The rise and fall of the final wolf pack offensive in the mid-Atlantic, the loss of an EAC aircraft, and the need to maintain Iceland as a base of operations against U-boats led to the squadron's frequent moves. The allocation of Allied anti-submarine aircraft and resources as part of the changing war in the Atlantic and the negotiations that surrounded these allocations resulted in the posting of 162 (BR) to Iceland. The squadron had already attacked a submarine by the time all of its personnel arrived on 31 March. It would sink its first U-boat just seventeen days later.

¹¹⁴ *ibid.* ; 162 (BR) ORB, March 1944, Appendix B, "Diary of No. 162 Squadron at Goose Bay & Gander"; *ibid.*, January 1944, Appendix B, "Narration", 1. In July of 1944 the Air Staff informed EAC that Dakotas were not to make transport flights to Iceland except on an "emergency basis", citing the limitations of the Dakota and the squadron's heavy commitments. The RCAF received its first transport B-24s in August, but they had to be converted from the standard bomber configuration and so did not enter service until mid-October. CAS to AOCinC, EAC, "Air Shipments to Iceland," 20 July 1944, DHist 181.003 (D4864); Vincent, Liberator and Fortress, 135.

¹¹⁵ 162 (BR) ORB, January 1944, Summary.

Chapter 5

First Encounters, First Successes: Early Operations from Iceland, January-May 1944

The Canadians' first home, "Camp Corbett", was anything but hospitable. Leaky walls let in the cold winds, antiquated coal stoves required stoking half a dozen times a night, and water pipes sprang leaks.

RCAF press release, June 1944¹

When 162 (BR) arrived in Reykjavik, Iceland, in January 1944, it joined 120 Squadron RAF, whose VLR Liberators were the only other anti-submarine aircraft operating from the island. The Canadians replaced a United States Navy Ventura squadron and the Hudsons of 269 Squadron RAF, both of which had been withdrawn in December because the short ranges of the aircraft limited their usefulness. Other factors, such as Coastal Command's desire to re-equip 269 Squadron with Liberators, also played a part in the withdrawal of the two squadrons and their replacement by 162 (BR).² Oversupplied with Canso squadrons, the Royal Canadian Air Force had sent 162 to Iceland and disbanded 117 (BR). The move to Iceland would be the first time that the RCAF would attempt to move a squadron and its aircraft overseas using Canadian resources. Unfortunately, problems in procuring transport ships and a lack of long-range transport aircraft in the RCAF meant that some groundcrew did not arrive until the end of March. Not only did these delays interfere with the squadron's operations, but they also demonstrated the shortcomings of the RCAF's transport capability. This lack of transport would bother 162 (BR) throughout most of its stay in Iceland. In addition to problems encountered during the move, the equipment and facilities provided by the RAF in Reykjavik were inadequate. Despite these difficulties, the change of scenery brought a change of luck for the squadron; within a month of beginning operations from Iceland a U-

¹ Royal Canadian Air Force. Directorate of Public Relations, Release No. 3340, No. 3, 1, 5 June 1944; Appendix to 162 (BR) ORB, February 1944.

² These factors were discussed in the previous chapter.

boat had been sighted and attacked, and by the middle of April 162 (BR) had scored its first success against the enemy.

The squadron arrived in Iceland as the island was becoming a base for offensive anti-submarine operations. The German attempt to re-introduce wolf pack operations in September 1943, which had begun with the battle surrounding convoys ONS 18 and ON 202 had failed, and the threat to convoys, especially in mid-ocean, was greatly decreased. Aircraft based in Iceland could now devote more of their flying time to patrolling what was known as the Northern Transit Area -- one of two main routes by which U-boats entered the Atlantic.³ Since the fall of France and Norway in 1940, advanced U-boat bases had been established on the coast. Nonetheless, U-boats on passage to the North Atlantic or the operational areas beyond it were still forced by geography to take one of two main transit routes. The first lay across the Bay of Biscay, from France into the North Atlantic. Allied efforts, spurred by the British, had attempted to cut this route using air patrols and surface ships in 1943. The second U-boat passage was through the gap between the British Isles and Iceland, most frequently between the Faeroes and Iceland (see Map 4). This second route was often called the Northern Transit Area, and was used by all submarines leaving Germany for French bases or operating from bases in Norway. Obviously, if the forthcoming Allied invasion of Europe forced the Germans from their French bases, the Northern Transit Area would become even more important for the maintenance of U-boat operations in the Atlantic. It would also be important during the invasion if U-boats from Norway and Germany tried to interfere with Allied landing operations or ocean convoys.⁴

³ Great Britain, Air Ministry, Air Historical Branch, "The RAF in Maritime War, IV: The Atlantic and Home Waters, the Offensive Phase, February 1943 to May 1944," 482, DHist 79/599.

⁴ There was a third passage into the Atlantic between Greenland and Iceland, the Denmark Strait, but it appears to have been rarely used by U-boats because its greater length reduced the length of time they could spend in operational areas. This route was used on occasion when air patrols in the Northern Transit Area were too intense for certain submarines. In June of 1944, for example, *U-862* used this route to enter the Atlantic due to its slow diving times, and *U-863* used the same route in August of 1944. Both were Type IXD₂ U-boats, a large design that was slow to

Britain had long recognized the strategic value of Iceland as a base for both sea and air operations. For much of the war Hvalfjordur north of Reykjavik (see Map 3) served as a base for Allied warships, while various airfields on the island supported ferry and transport operations in addition to their important function as bases for maritime air operations in support of Atlantic convoys. In late September of 1939, the RAF's sole Catalina had reconnoitred the south and southwestern coasts of the island, searching for suitable sites for bases. British forces occupied the island on 10 May 1940. The first RAF aircraft dispatched to support them were Fairey Battles of No. 98 Squadron. Although they had originally been designed as light bombers, the Battles in Iceland were increasingly allocated to maritime reconnaissance, a role for which the single-engined aircraft were unsuited and the aircrew were untrained. In January of 1941 the RAF decided to send a squadron each of Hudsons and Sunderlands to Iceland, and No. 30 Wing was established in April 1942 to control the three squadrons based there. It came under control of 15 Group, headquartered in Liverpool. Six months later, Iceland became an independent headquarters under the control of Coastal Command HQ, and eventually assumed responsibility for all RAF operations on the island. The Battles of 98 Squadron were withdrawn in mid-1942, and were replaced by No. 330 (Norwegian) Squadron, which operated Northrop N-3PB floatplanes in the maritime air role. By the end of the war, in addition to 162 (BR), thirteen squadrons of the Royal Air Force and Royal Norwegian Air Force had operated under British control from Iceland.⁵ This was in addition to the

dive, an unhealthy characteristic in the face of heavy air patrols. It appears that *U-863* was routed the same way for the same reasons despite having been fitted with a schnorkel. *ibid.*, IV, 486; Great Britain, Air Ministry, Air Historical Branch, "The RAF in Maritime War, V: The Atlantic and Home Waters - The Victorious Phase, June 1944 to May 1945," 58; Eberhard Rössler, The U-boat: The evolution and technical history of German submarines, (London: Arms and Armour, 1981), 150-151, 337. One of the most important consequences of the efforts against the transit route through the Bay of Biscay was the effective reduction of U-boat operational ranges in the Atlantic. This reduction became especially important after the U-boat tankers were destroyed in mid-1943. Brian McCue, U-Boats in the Bay of Biscay: an essay in Operations Analysis, (Washington, DC: National Defense University Press, 1990), 154-155.

⁵ Denis Richards and Hilary Saunders, Royal Air Force 1939-1945, Volume I: The Fight at Odds, (London: HMSO, 1974), 222-223; Donald F. Bittner, The Lion and the White Falcon:

numerous American squadrons, both Navy and Army Air Force, which operated from the island.

At 1755 local time on 6 January 1944, Flying Officer A. Hildebrand and crew, accompanied by four groundcrew, became the first members of 162 (BR) to arrive at Camp Corbett, the RAF base at Reykjavik. The final aircraft arrived on 31 January, and by this time the squadron had already begun operations. The first flight from Iceland appears to have been on the 15th, when F/L MacBride and crew in Canso "A" 9759 carried out depth charge practice, but operational flying from Reykjavik did not begin until 24 January, when a fourteen hour anti-submarine sweep was flown by F/O Leech and crew in 9754.⁶ By the end of the month, five anti-submarine patrols had been flown, and a sixth had been cut short by instrument failure in the aircraft. The squadron's total flying time for January was just over 360 hours, with slightly more than 270 occupied by the ferry flights from Dartmouth to Reykjavik. Operational flying came to just under 60 hours, while training and testing flights made up the remainder of the squadron's flying time.⁷

The initial plans for 162 (BR)'s move to Iceland had assigned the squadron living facilities in Camp Corbett, which had been established following the British occupation of the island in May of 1940, but during January 1944 plans were made to relocate the squadron within the base. Air Vice Marshal Curtis' tour of Camp Corbett on 8 January, described in the previous chapter, revealed shortcomings in the quarters provided for the Canadians at the RAF facilities. Leaky walls let in cold winds, the coal fired stoves in the huts required repeated stoking during the night, and water pipes leaked. As a result, 162 (BR) was moved to the former USN Fleet Air Facilities Base, "Camp Kwitcherbelliakin", which was also located at the Reykjavik airfield. The base, which had been operated by the

Britain and Iceland in the World War II Era, (Hamden, Conn: Archon Books, 1983), 70. For a brief history of 330 Squadron up to February 1945, see "Norwegian Squadrons in Coastal Command," Coastal Command Review, 4:2 (February 1945), 18-19, DHist 181.003 (D963).

⁶ 162 (BR) ORB, 15-24 February 1944.

⁷ *ibid.*, summary for January 1944.

United States Navy, was turned over to the RAF under Lease-Lend arrangements. The squadron's living accommodations were located on the former American base, and the maintenance facilities near the runways, with the exception of a large hangar provided by the RAF, were also part of the US base. "Camp Kwitcherbelliakin" quickly received the more Canadian name "Camp Maple Leaf" from the RCAF.⁸

The squadron began its move on 1 February, while the Americans on the base were still preparing to leave. Squadron officers and senior NCOs were posted as guards at the gates of the camp in order to prevent pilfering and scrounging of the equipment left for the squadron by the departing Americans. Several essential services, like the telephone switchboard and the truck for refuelling oil stoves were operated by the Canadians as the Americans left since the RAF had not yet taken over the services. Officers, NCOs, and Other Ranks moved into their new home on 2 February, and normal routine was set aside in order to establish the squadron as quickly as possible in its new home.⁹ Squadron equipment had only just begun to arrive and was still being unloaded at the time of the move. The RCAF Marine Craft *Eskimo* had arrived on 25 January, and the *Beaver* arrived on 4 February, but limited space at the pier in Reykjavik delayed the unloading of the latter for three days.¹⁰ Nineteen of the squadron's groundcrew also arrived from Goose Bay via 10 (BR) Liberator on the 4th, with engine failure keeping the aircraft at Reykjavik until an

⁸ Royal Canadian Air Force. Directorate of Public Relations, Release No. 3340, No. 3, 1, 5 June 1944; Appendix to 162 (BR) ORB, February 1944; "No. 162 Squadron (RCAF) - Miscellaneous Costs of Squadron at Iceland," 1 February 1945, 2, DHist 181.009 (D3410). For a discussion of the establishment of air bases in Iceland, see Bittner, The Lion and the White Falcon, 79-85. The squadron was not able to take full advantage of their lone hangar because an RAF Liberator undergoing repairs had been occupying the rear of the building since sometime in 1943. The aircraft did not leave the hangar until the beginning of September 1944. 162 (BR) ORB, September 1944, Appendix K, "Maintenance Report for September, 1944".

⁹ *ibid.*, 1 February 1944. The guards were apparently not entirely successful; according to one squadron member, RAF personnel succeeded in "scrounging" equipment and furniture from the base. Conversation with C.V. MacLachlan, 27 December 1995, Ingersoll, Ontario. The Americans had also begun to remove some of the base equipment prior to leaving, but had left much of it behind once they discovered that Canadians would occupy the base. "Interview by Roger Sarty with Ray Crone," 13 June 1993, 6, DHist Biographical File; 162 (BR) ORB, 1-8 February 1944.

¹⁰ *ibid.*, 25 January, 4-7 February 1944.

engine change could be made, a task which increased the burden on the squadron's shorthanded groundcrew and occupied valuable hangar space on the base. Another Liberator arrived on the 6th. Nine attempts were made between 29 January and 7 February to transport three flights of fifty-seven personnel to Reykjavik, but only two, on 4 and 6 February, were successful.¹¹

While the standard of accommodations were improved by the move, the rations had not. They were supplied by the RAF, and were "not as good as the R.C.A.F. issue, but are well within the essentials for life. Mostly lacking in quantity and quality of beef and fruit. Also considerable amount of food is dehydrated. Coffee is especially conspicuous by its total absence, tea being the substitute."¹² Additionally, much of the ground equipment and facilities such as offices and hangars that were supposed to be provided by the RAF were either inadequate or had not been organized for an incoming squadron. Motor transport was also inadequate, with vehicles often unserviceable. This problem was to vex the squadron for months to come, although new equipment was expected from England.¹³ There were also some shortcomings with the airport at Reykjavik. The squadron ORB noted that the

runways [are] of average length but inclined to be rough. One runway taking off over a small hill cannot be used with safety with an operationally loaded Canso "A" aircraft. . . . No. 120 Squadron [RAF] Liberators take off from this base with a light gas load, land and refuel at Meeks Field [at Keflavik] before proceeding on operations. It is not considered necessary for our Cansos to adopt this system.¹⁴

As later experience was to show, however, the squadron would occasionally have to resort to this cumbersome system when winds were unfavourable. The runways, covered in

¹¹ *ibid.*, 1-8 February 1944, March 1944, Appendix B, "Diary of No. 162 Squadron at Goose Bay & Gander," 1.

¹² *ibid.*, summary for Reykjavik, January 1944.

¹³ *ibid.*

¹⁴ *ibid.*

“flinty particles” of the local lava rock, caused considerable wear to the Cansos’ tires, destroying nine nose wheel and nine main wheel tires in February and March alone.¹⁵

Since the move to Iceland placed the squadron close to the United Kingdom, plans were made to take advantage of the courses offered by the RAF. An anti-submarine course was held at Maydown, Northern Ireland, near Ballykelly (see Map 5), and navigation, gunnery, bombing, safety equipment and other courses were offered elsewhere. The first attempt to send a crew on the A/S course was foiled by problems with the aircraft, but subsequently every crew in the squadron attended the two week course, which consisted of ground school at Maydown and training missions from the nearby Coastal Command station at Ballykelly. Training flights included practice attacks on a “tame” submarine assigned to the course, which provided realistic training for the aircrews. The first of the squadron’s crews left for the course on 8 February, taking along another crew who were on semi-annual leave. The scheme of transporting crews on leave to the British Isles via squadron aircraft on operational flights was formally approved on 24 March.¹⁶ Compared to the training offered by Eastern Air Command, the two weeks in Northern Ireland were undoubtedly the most intense and comprehensive training that the squadron’s aircrew had ever experienced, and it was especially important in light of changing U-boat tactics that meant fewer sightings and required aircrew to make the most of the opportunities they encountered.

During the squadron’s move from Canada to Iceland the nature of the U-boat war in the Atlantic had changed yet again. Serious threats to ocean convoys had almost entirely disappeared. In November and December 1943, only 3 surface escorts and 4 aircraft were lost, and 2,218 merchant ships from 72 convoys reached their destinations without loss.

¹⁵ *ibid.*, March 1944, Appendix C, “Maintenance”, 4.

¹⁶ *ibid.*, 31 January, 8 February, 24 March 1944, summary for Reykjavik, January 1944; “Interview by Roger Sarty with S.E. Matheson,” 14 June 1993, 2, DHist Biographical File. There was no real leave for squadron groundcrew. “Interview by Roger Sarty with Ray Crone,” 13 June 1993, 5, 7-8, DHist Biographical File.

In return, twelve U-boats were sunk. By January 1944, only scattered groups totalling thirty U-boats patrolled the northeastern Atlantic in the face of heavy surface and air patrols.¹⁷ Beginning in the middle of December 1943 German tactics had changed, and now involved maximum submergence during daylight hours, surfacing mainly at night to recharge batteries and make tactical movements. This change placed an even greater emphasis on nighttime operations by anti-submarine aircraft. Pack tactics on convoys virtually disappeared in the face of Allied air patrols that denied submarines the use of the surface. From 7 January onwards U-boats were assigned individual patrol areas west of the British Isles, and depended on aerial reconnaissance to locate Allied convoys and organize pack attacks. Aerial reconnaissance proved ineffective in co-ordinating such attacks, and the dispersal of force further reduced the effectiveness of the submarines.¹⁸

By late January, when 162 (BR) began operations from Iceland, the new scheme of U-boat operations had failed, largely because of technical problems experienced by German reconnaissance aircraft and the Allied air support from escort carriers accompanying the support groups. Beginning in early February the U-boats of groups *Hinein* and *Stürmer*, which had been operating off the entrance to the North Channel (see Map 5) began withdrawing to the west and south in the face of increasing Allied activity. Two escort carriers, screened by Captain F.J. Walker's 2nd Escort Group, were dispatched to support convoys west of Ireland. Operations planned against a forthcoming ONS convoy on 14-18 February also required a westward readjustment of the submarines. Defects again plagued the aircraft assigned to reconnaissance duty, and although contact was briefly established early on the 19th, air cover from an aircraft carrier attached to the convoy forced the

¹⁷ Air Ministry, "The RAF in Maritime War," IV, 206; S.W. Roskill, The War at Sea, 1939-1945, Volume III: The Offensive, Part I - 1st June 1943-31st May 1944, (London: HMSO, 1960), 248.

¹⁸ Air Ministry, "The RAF in Maritime War," IV, 209; Marc Milner, The U-Boat Hunters: The Royal Canadian Navy and the Offensive against Germany's Submarines, (Toronto: University of Toronto Press, 1994), 98-99; Günter Hessler, The U-boat War in the Atlantic, Volume III: June 1943-May 1945, (London: HMSO, 1989), 41-43. See *ibid.*, 36-46, for an account of command decisions and U-boat dispositions during the period from November 1943 to February 1944.

submarines to submerge and break contact at daybreak. By 24 February, the German attack on convoys in the Western Approaches to England had failed to record any real success. Between 31 January and that date, eleven U-boats were lost, six of them to the 2nd Escort Group, and in return only one escort, HMS *Woodpecker*, one merchant ship straggling from a convoy, and two Coastal Command aircraft had been lost.¹⁹

During this time aircraft from Iceland, in conjunction with those from Coastal Command's 15 and 18 Groups, supported convoys in the Western Approaches. U-boat traffic through the Northern Transit Area had been falling off since early January, when Dönitz had decided to reinforce the Arctic U-boat flotilla in order to attack convoys to North Russia, and diverted half of the new Type VII submarines entering service to Narvik, in northern Norway. The traffic through the area dropped even more when the German High Command decided on 16 February to build up a reserve of U-boats in southern Norway, called Group *Mitte*. Ten to fifteen Type VII U-boats were to be held in various ports to provide a reaction force in case of Allied landings in southern Norway or in Denmark. As a result of the diminished U-boat traffic through the Northern Transit Area and the decreased air coverage during the first two months of 1944, none of the fifteen U-boats passing through the area at that time were sighted.²⁰

The squadron's flying in the first part of February consisted mainly of anti-submarine coverage for convoys and anti-submarine sweeps, many apparently in support of the convoy battles mentioned above. Meteorological flights, which were an essential component of weather forecasting not only for the North Atlantic but also for the weather in Europe, were also carried out. With the impending invasion of the continent accurate information about the weather became increasingly important. Mid-winter weather in the

¹⁹ Hessler, *The U-boat War in the Atlantic*, III, 43-46; Roskill, *The War at Sea*, III, pt. 1, 249-254. One of the U-boats, U-283, had been sunk by a Wellington of 407 Squadron, RCAF, on 11 February. The movements of the combatants in the Western Approaches are recorded in Map 17 of Roskill, *The War at Sea*, III, pt. 1.

²⁰ Air Ministry, "The RAF in Maritime War," IV, 482-483.

North Atlantic was often unpleasant and soon interfered with the squadron's operations. On 7 February Canso "A" 9767 was diverted to Stornoway (see Map 5), which, although it was in Scotland, was one of the nearest alternate bases for the squadron.²¹ Two days later a submarine sighting was made by a Liberator of 120 Squadron RAF, also based in Iceland, and one of 162's flights on the following day was devoted to searching the area of the sighting. The same day the difficulty in dealing with even simple technical problems when the RAF was unable to provide spare parts was amply illustrated. One of the patrols had to carry a spare nosewheel tire and tube to Stornoway to repair one of the squadron's aircraft, since no Canso "A" undercarriage or hydraulic spares were available in the United Kingdom. These difficulties were underlined on 20 February, when another spare tire had to be ferried to Stornoway.²²

Further trouble was experienced on 12 February, when all flying from Reykjavik was prevented by hail, rain, and winds of up to sixty knots. An aileron on Canso 9810 was damaged by high winds, and an elevator was blown off of a DC-3 on another part of the base, the first but not the last instance of this problem for the squadron. Two flights were made by aircraft that had previously been diverted to Stornoway, but neither could make Iceland due to the weather. The following day the weather relented and allowed nineteen more groundcrew to arrive from Goose Bay on board a 10 (BR) Liberator, while the squadron carried out patrols and flight tests. It closed in again the following day with a gale, which grounded the squadron's aircraft and flooded many of the huts in the camp. Flying was possible but difficult on the 15th. Canso "A" 9759 flew close escort on a convoy, but a Liberator from 120 Squadron sent to relieve it was forced to return by severe icing. Local familiarization and radar calibration flights were also made, but another Canso was put out of service by heavy winds that damaged one of its elevators. The squadron's

²¹ 162 (BR) ORB, 1-8 February 1944.

²² *ibid.*, 10, 20 February 1944, March 1944, Appendix B, "Service Training Report," 4.

ORB observed that “these high winds are obviously going to cause a lot of trouble with aileron[s] and elevators.”²³

It was not just aircraft that were suffering because of the conditions in Iceland. In light of the inadequacies of RAF rations and problems with the provision of other services, S/L Chapman approached the United States Navy at Camp Knox to discuss the possibility of obtaining laundry, extra rations, liquor, and films from the Navy, but “diplomatic issues” meant that the USN could not handle the squadron’s laundry, and there were problems with the supply of films. The Navy agreed to supply some extra rations such as fruit, eggs, and fruit juices on a cash and carry basis, while steps were taken to place the squadron on the American film distribution circuit in Iceland. Efforts to obtain additional food from the Americans underlined the problems with the RAF-operated kitchens and the RAF rations. A report made in March listed rations not normally available through ordinary RAF sources in Iceland; they included canned fruit and vegetable juices, canned tomatoes, corn, and peas, canned soups, tinned fruits, and coffee.²⁴ The report also requested “at least two good Canadian Cooks,” which highlighted yet another problem with the RAF rations – their preparation. One former squadron member remembered the food at the outset as “ghastly, and served in unsanitary facilities. . . he was handed a plate, with a

²³ *ibid.*, 12-15 February 1944.

²⁴ *ibid.*, 15-16 February 1944; March 1944, Appendix B, “Service Training Report,” 3. The inadequacies of the RAF rations were even reported in RCAF press releases, which mentioned that vitamin pills were issued to make up for the lack of fresh vegetables. RCAF Directorate of Public Relations, Press Release No. 3340, No. 3, 5 June 1944. The lack of fresh vegetables is perhaps not surprising considering wartime rationing, the time of year, and the difficulties of shipping rations to Iceland; the lack of some basic canned vegetables is somewhat harder to understand.

American laundry facilities would have been most welcome: the laundry service provided by the RAF only took care of some 25% of the personnel’s laundry. The RAF washed all the sheets and pillowcases every two weeks and the blankets once a year. Number 407 Squadron, another Canadian unit serving with Coastal Command, also experienced the problems of infrequent RAF laundry, but were even worse off because the RAF issued them no sheets whatsoever. Coupled with the infrequent washing of blankets, these conditions led to outbreaks of impetigo. “No. 162 Squadron, Reykjavik, Iceland,” Appendix C, “Establishments and Capitation Rates,” 1 February 1945, 4, DHist 181.009 (D3410); Brereton Greenhous, Stephen J. Harris, William C. Johnston, and William G.P. Rawling, The Crucible of War, 1939-1945: The Official History of the Royal Canadian Air Force, Volume III, (Toronto: University of Toronto Press, 1994), 399.

huge black thumb mark from the server's grimy hands. The meal was grey goop that was supposed to be liver and onions. He immediately dumped the goop in a trash bin and headed to the canteen to buy a couple of chocolate bars."²⁵

The weather prevented flying until the 18th, when two aircraft returned to Reykjavik from bases to which they had been diverted, and Liberator 586 of 10 (BR) which had arrived on 13 February left for Gander. The other Liberator, which had arrived on 4 February and required an engine change, was apparently still in Reykjavik. Liberator 586 was bound for Gander, but was diverted to Goose Bay while en route. It never arrived. The squadron offered to participate in the search for the missing aircraft, but this proved unnecessary. Four days later, the aircraft was located near Goose Bay after an intensive search. Its crew of five had survived, but F/O David Griffin, an EAC Public Relations Officer, had been killed in the crash.²⁶

So far the squadron seemed to be settling in to an operational routine, despite the numerous problems incurred by their recent move. On 22 February the routine was broken, when 162 (BR) had its first encounter with the enemy since coming to Iceland. Flying Officer C.C. Cunningham and crew were performing an anti-submarine sweep south of Iceland in Canso "A" 9841, well to the north of the battle that was then underway in the Western Approaches.²⁷ They were covering the projected path of two U-boats believed to be heading for the main concentration of U-boats in the Atlantic. Flying at 3000

²⁵ "Interview by Roger Sarty with Ray Crone," 13 June 1993, 4-5, DHist Biographical file. Other Canadian squadrons stationed at British bases experienced problems with the quality of RAF rations. Volume III of the RCAF official history quotes contemporary sources which described the food served to 407 Squadron personnel as "unappetizing, badly cooked and sloppily served" on dishes that were "consistently dirty". Greenhous *et. al.*, The Crucible of War, 399.

²⁶ 162 (BR) ORB, 18-22 February 1944; Goose Bay ORB, 18 February 1944; 10 (BR) ORB, 22 February 1944; Les Allison and Harry Hayward, They Shall Grow Not Old: A Book of Remembrance, (Brandon, Manitoba: Commonwealth Air Training Plan Museum, Inc., 1996), 283. The crashed Liberator and its crew was located by Jim Goudy, a native trapper, who walked to Goose Bay in order to make a report. The Goose Bay ORB contains a complete description of the locating and rescue of the survivors.

²⁷ The crew consisted of F/O C.C. Cunningham, pilot, F/O R.B. Murray, co-pilot, F/O W.V. Coffyn, navigator, F/O V. Banning, WAG, WO2 J. Somerville, WAG, Sgt. G.L. Gratton, WAG, Sgt. J.H. Girard, flight engineer, Sgt. P. Gronin, flight engineer.

feet with 6/10 cloud cover extending from 2000 feet upwards, there was a heavy swell on the choppy seas. At 1405 local time, the co-pilot, F/O R.B. Murray, sighted a surfaced submarine heading 240° at about twelve knots three miles away and ten degrees to starboard. Cunningham threw the aircraft into a dive and attempted to make a bow attack on the U-boat, but the submarine turned hard to port and opened fire with its anti-aircraft armament.²⁸ The Canso and the U-boat jockeyed for position, making at least four complete counter-clockwise circles in the following twelve minutes. The aircraft remained some 1500 yards from the submarine and was roughly astern of it at most times. Evasive manoeuvres by the aircraft in the face of heavy anti-aircraft fire prevented the U-boat's crew from scoring any hits. After twelve minutes, Cunningham found himself directly astern of the submarine and threw the Canso into a hard turn to port, then to starboard, making an attack across the U-boat from port to starboard at an angle of 110 degrees. On the run in, all three of the aircraft's gunners opened fire on the U-boat as their guns could be brought to bear, hitting the conning tower and the crew, at least three of whom were seen to fall.²⁹

Skimming the ocean at fifty feet, four Mark XI Torpex depth charges set to twenty-five feet were released with a spacing of seventy feet. The first depth charge exploded fifty feet to starboard of the fully surfaced submarine, forward of the conning tower, while the

²⁸ This patrol was almost certainly planned using information from the Admiralty's OIC (Operational Intelligence Centre), which used various forms of intelligence, including DF bearings and Enigma intercepts, to plot the location of enemy U-boats and surface vessels. Probably for reasons of security, the EAC weekly intelligence summary makes no mention of the information used to plan the patrol. "EAC Weekly Intelligence Summary for Weekly Period Ending February 27, 1944," DHist 181.009 (D763). The attack assessment describes the A/A fire as "cannon and machine gun" fire. RCAF Coastal Command ORB, February 1944, App. E, Form UBAT, DHist 181.003 (D886); U-Boat Attack Assessment Form, Serial 997, 22 February 1944, PRO AIR 15/137. The actual armament consisted of two twin 20 mm and one 37 mm cannon, and can be seen in photographs of the attack. See *Coastal Command Review*, 3:2 (February 1944), 25, Plate 2, for photographs of the attack and resultant oil slick. The advantage of making a bow attack on the U-boat was that the anti-aircraft armament, which was emplaced behind the conning tower, was less easily able to bear on the attacking aircraft.

²⁹ RCAF Coastal Command ORB, February 1944, App. E, Form UBAT, DHist 181.003 (D886); U-Boat Attack Assessment Form, Serial 997, 22 February 1944, PRO AIR 15/137; 162 (BR) ORB, 22 February 1944.

following three impacted with a spacing of about one hundred and fifty feet, probably caused by the aircraft pulling out of its dive. The Canso banked hard to starboard and returned to make another attack, this time with machine guns only. No return fire was experienced, and the U-boat turned rapidly to starboard, slowly submerging some two minutes after the depth charges had been released, following which a sizable oil slick appeared on the surface. It grew to a length of two miles, apparently indicating the underwater path of the submarine. The airplane circled the site of the attack for six hours, homing in Liberator K/120. By the time the Canso returned to base, it had been airborne for almost fifteen hours.³⁰

This attack demonstrated some of the problems of attacking U-boats that chose to fight back on the surface, as well as the difficulties of assessing the results of such attacks. The essential function of machine gun fire from the aircraft, especially fire from forward-facing weapons, in suppressing flak on the run-in to the target was apparent. That the aircraft was not hit by flak during its fifteen minute engagement with the submarine was partly due to the effectiveness of its machine gun fire on the run-in, since almost 800 rounds were fired from the aircraft's gun positions, all three of which estimated hits.³¹ The U-boat's inability to score any hits during the initial manoeuvres is also significant. It not only demonstrates the importance of evasive tactics by the aircraft, surely a difficult task for the large, slow Canso, but the basic unsuitability of the U-boat as a gun platform due to its

³⁰ *ibid.* The identity of this U-boat has apparently not been determined. Douglas describes it only as an "unsuccessful attack." 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), 592. The identity can be narrowed to a few U-boats however, assuming that the identification of the submarine as a Type IX U-boat in Coastal Command Review is correct. Five such boats might have been in the area at the time: *U-546*, *U-549*, *U-550*, *U-802*, and *U-846*. An attempt to identify the U-boat would be worthwhile. Coastal Command Review, 3:2 (February 1944), 25, Plate 2; Hessler, The U-Boat War in the Atlantic, III, 113, 115, diagrams 24, 25; Rössler, The U-boat, 335-336.

³¹ RCAF Coastal Command ORB, February 1944, App. E, Form UBAT, DHist 181.003 (D886).

low freeboard and lack of stability undoubtedly played a role as well.³² In addition to problems caused by its large size, low speed, and relative lack of manoeuvrability when encountering enemy flak, the Canso's weapons load was also limited. The maximum load of four depth charges limited the aircraft to one attack, with no weapons left for an effective second attack if it proved necessary or possible. In contrast, Liberators could carry up to ten 250 lb. depth charges, which allowed for a second attack.³³ In this instance, the U-boat remained on the surface after the aircraft's first pass, and offered no return fire during the second pass. Had the Canso been capable of carrying additional depth charges or other weapons effective against a surfaced submarine, the destruction of the U-boat might well have resulted.

The difficulty of assessing the results of an attack is also evident. The aircrew described the submarine as a "517 ton type" (Type VII) U-boat, and the squadron's ORB described the attack as having scored an "estimated two hits."³⁴ In actual fact, photographs taken during the attack allowed Coastal Command to identify the U-boat as a "740 ton" type (Type IX), and calculate that the nearest depth charge had detonated some 50 feet from the U-boat's hull. This was outside of the lethal radius of the Mark XI depth charge, which was about twenty-five feet, although the oil trail left on the surface indicated that at

³² The stability of the surfaced Type VIIC U-boat was degraded by the additional anti-aircraft armament and bridge armour that had been added. In bad weather, the average roll would reach 30 degrees on each side, and rolls of up to 60 degrees were not unusual. Hessler, The U-boat War in the Atlantic, III, 42. Since the submarine under attack was a Type IX, with greater beam and displacement, it would have been more stable and less prone to drastic rolling than the smaller and lighter Type VII, but it would still have been a poor gun platform.

³³ A British description of the Catalina in 1942 stated that "Although the Catalina may be 'handy' I do not think we can describe it as manoeuvrable". Letter from VCAS to CinC Coastal Command, 30 January 1942, PRO AIR 15/488. The number of depth charges carried depended on the version of the Liberator and its particular weapons load. Air Ministry, "The RAF in Maritime War," IV, app. X. The limiting factor for the Canso and Catalina in Canadian service was the number of bomb carriers (4) rather than the maximum weapons load. Greater numbers of depth charges and specialized weapons could be carried with some modifications, but they were not used by 162 (BR).

³⁴ U-Boat Attack Assessment Form, Serial 997, 1; 162 (BR) ORB, 22 February 1944.

least some damage had been inflicted.³⁵ The crew's report led Captain D.V. Peyton-Ward, the Naval Staff Officer at Coastal Command, to state that "a flak-minded U/B [was] out-maneuvred by a well timed reverse turn and a courageous attack in the face of intense flak," and conclude that "very good shooting by aircraft gunners . . . seems to have inflicted severe casualties to U/B's gun crews and finally smothered his flak."³⁶ The Air Staff Officer at Coastal Command noted that although the U-boat had been sighted "at a distance rather below the average in similar conditions," the aircraft's "anti-flak tactics were very good indeed and it is a pity that the attack was marred by the overshoot of the D.C. [depth charge] stick."³⁷

Back in Reykjavik 162 (BR) was preparing to put all available aircraft into the air on a search to exhaustion in the morning, stopping flying training on the 23rd in order to free up more aircraft. During the five days following the attack, the squadron logged approximately 250 operational flying hours searching for the U-boat. Four Cansos were on anti-submarine sweeps on 23 February, all of them up for over fourteen hours. Area Combined Headquarters (ACHQ) ordered two fifteen hour patrols in spite of a previous agreement with the Senior Air Staff Officer (SASO) limiting them to fourteen. The following day ACHQ requested two more fifteen hour patrols, which led to a discussion between W/C Chapman, the squadron's OC, and the SASO. In future, only fourteen hour patrols would be requested except in exceptional circumstances, and then only with the concurrence of the squadron commander.³⁸ The maximum patrol time of fourteen hours had been instituted once the squadron had moved to Iceland. Previously, EAC had mandated a maximum patrol time of sixteen hours for its Cansos, in order to allow for

³⁵ Coastal Command Review, 3:2 (February 1944), 25, Plate 2; U-Boat Attack Assessment Form, Serial 997, 2.

³⁶ *ibid.*

³⁷ *ibid.*

³⁸ 162 (BR) ORB, 23-24 February 1944, summary for February 1944. The squadron's lack of equipment for night flying would have impaired its ability to carry out a search to exhaustion unless it was carried out in conjunction with another squadron. The consequences of these inadequacies are discussed below.

diversions to other bases in bad weather. Alternate bases for aircraft operating from Iceland were farther away, which reduced the prudent patrol time to fourteen hours. An examination of flying records shows that Stornoway, in Scotland, one of the nearest alternate bases, was usually seven hours' flying time from Reykjavik, as was the base at Ballykelly in Northern Ireland.³⁹

The risks of fifteen hour patrols were demonstrated on the 25th, when such a patrol was requested by ACHQ. A slightly longer patrol was flown, and stronger headwinds than had been predicted for the trip back to Iceland resulted in a patrol lasting almost seventeen hours. The dangers of weather in and around Iceland were emphasized the following day, when a Canso returning from a fourteen hour patrol encountered poor weather over Reykjavik which kept the aircraft in the air for another hour. By that time, the aircraft was running low on fuel. Another U-boat was sighted on 27 February, this time by a meteorological flight from Iceland. The squadron's standby aircraft was ordered to proceed to the scene, but weather prevented its departure.⁴⁰

During this flurry of activity 162 soldiered on without its full complement of personnel. Although some groundcrew had been flown in from Goose Bay in February, others had yet to arrive. As a result of the shortage of ground maintenance equipment, the demands placed on the squadron since its arrival in Iceland, and the shortage of groundcrew, the squadron had been forced to curtail training in order to maintain a normal tempo of operational flying. On average, only four of the squadron's fifteen aircraft were serviceable on any given day, the lowest rate of serviceability since the squadron had received its full establishment of aircraft and personnel.⁴¹ The squadron's ORB noted that "although this unit is carrying on, and can carry on indefinitely, under the present

³⁹ "Interview by Roger Sarty with S.E. Matheson," 14 June 1993, 2, DHist Biographical File; 162 (BR) ORB, February 1944.

⁴⁰ 162 (BR) ORB, 25-27 February 1944.

⁴¹ *ibid.*, Summaries for May 1943 to February 1944. On average, between nine to twelve aircraft were serviceable in earlier months, except in December when all aircraft were serviceable but were preparing for the move to Reykjavik.

conditions it would be found impossible to cope adequately with a serious flap requiring a large number of aircraft.”⁴² On 28 February, S/L Sully, one of the squadron’s senior officers, was grounded and placed in charge of maintenance, while S/L Poag was grounded and placed in charge of training, operational flying, and aircrew discipline. Despite problems with maintenance, the squadron logged 422 hours of operational flying in February, as well as almost 117 hours of training and testing.⁴³ The remainder of the groundcrew, as well as adequate maintenance equipment, would be required if the squadron were to develop an adequate training programme and have aircraft available for intensive operations.

The continued absence of part of the squadron’s groundcrew attracted the attention of Group Captain Moreton, the Station Commander at Reykjavik. The squadron ORB recorded that on 1 March

G/C Moreton called inquiring when remainder of Sqn. personnel will be arriving. He was disturbed by the delay and said that he did not consider that all possible action was being taken to hasten arrival. O.C. said he could suggest no method of hastening but would greatly appreciate any action which Stn. Cmds. could take to hasten the matter. C.O. said that aircraft were arriving in large quantities from overseas (Canada) and could not understand why Liberators could not come through. . . . A.O.C. Iceland, later advises that he had sent signal asking what the policy would be re. delivery of our remaining personnel in Iceland as this Sqn. cannot be expected to be 100% efficient until their arrival.⁴⁴

In fact, efforts had been underway for some time to transport the personnel remaining in Goose Bay to Reykjavik. Following attempts in late January and early February that had proved only partly successful, a request had been made of EAC by those left in Goose Bay to allow them to travel in aircraft other than 10 (BR)’s Liberators, which had been specified in the squadron’s movement orders. The Royal Air Force’s Transport Command (RAFTC) was flying Douglas Dakotas to the United Kingdom via Goose Bay and Reykjavik, and the message proposed that the remaining personnel make the flight by

⁴² *ibid.*, Summary for February 1944.

⁴³ *ibid.*, 28 February 1944, summary for February 1944.

⁴⁴ *ibid.*, 1 March 1944.

RAFTC Dakota. EAC turned down the proposal on 11 February, and the ORB records that "officers and men were now thoroughly disgusted and morale struck a new low."⁴⁵ Subsequent attempts on the 12th to transport personnel in Liberators were unsuccessful, and the search for a missing Canso, followed by the search for Liberator 586 mentioned above, occupied aircraft and prevented any further ferry attempts until 23 February. At that point, one flight of nineteen personnel left by Liberator for Gander, but in spite of their departure before the others, they would be the last to arrive in Iceland. In the meantime, provisions were made on 26 February for the squadron personnel remaining in Goose Bay to be transported to Iceland by Douglas Dakotas of the RAF Transport Command, while 10 (BR) was relieved of the duty. The squadron was notified of the change on 28 February, but the procedure for the move was not finalized until a week later. By 10 March, more than two months after the move to Reykjavik had begun, the squadron was still short 129 personnel, and despite these new arrangements, the last of the squadron's personnel were not to arrive in Iceland until the end of the month.⁴⁶

Following the unsuccessful series of attacks on convoys in the Western Approaches in January and February 1944, the U-boat Command (BdU) realized that despite new weapons such as the *Zaunkönig* homing torpedo and increased anti-aircraft armament, new radar detectors, and the use of aerial reconnaissance, operations against convoys were no longer practical. The high rate of losses threatened to leave BdU without the submarines necessary to sustain a war at sea. Beginning in late February the U-boats operating in the Western Approaches were ordered gradually westward and became even more dispersed as heavy Allied anti-submarine operations took their toll. On 22 March group *Preussen*, which had been formed in late February, was dispersed and its component submarines

⁴⁵ *ibid.*, March 1944, Appendix B, "Diary of No. 162 Squadron at Goose Bay and Gander," 1.

⁴⁶ HQ EAC to No. 1 Group, signal A.333, 26 February 1944, DHist 18-1.009 (D274); 162 (BR) ORB, 10 March 1944, March 1944, Appendix B, "Diary of No. 162 Squadron at Goose Bay and Gander," 1-2.

allocated to large patrol lanes in the Atlantic.⁴⁷ New Type VII U-boats, as mentioned above, were detailed to reinforce the Arctic flotilla and build up Group *Mitte* in Norwegian ports as a counter to a possible Allied landing in Norway or Denmark. As a result, only two new Type VIIIs had joined the Atlantic fleet between early February and late March. BdU realized that with only eighteen operational Type VII U-boats in the Atlantic, six of which were assigned to special inshore operations and weather reporting, insufficient type VIIIs remained for operations against convoys. Finally, the losses suffered by German long-range aircraft in operations in the Western Approaches effectively eliminated aerial reconnaissance in support of the submarines.⁴⁸ In March the decision was taken to abandon convoy attacks and redeploy the available U-boats on individual operations designed to tie down Allied anti-submarine forces until new submarine types then under development would allow the resumption of convoy operations with a greater chance of success. Losses remained heavy, however, and the number of submarines in the Atlantic continued to decrease during April and May. By the end of the latter month, only five U-boats remained in the North Atlantic, making weather reports that were essential to both air and land operations.⁴⁹

In the Northern Transit Area U-boat traffic began to pick up in March following the decreases in January and February, and in the last week of the month, Type VII boats began to enter the Atlantic from Norwegian ports once again. The decreasing threat to convoys in the North Atlantic, however, allowed aircraft, mainly from 18 Group, to cover the area more intensively. Despite the additional coverage and the increased number of U-boats in the area, however, no sightings were made. In April, with even more U-boats in the area and roughly the same amount of aircraft coverage, no sightings were again made. The tactics of maximum submergence adopted by U-boats proved effective in the Northern

⁴⁷ Hessler, The U-boat War in the Atlantic, III, 51, 56.

⁴⁸ There were only nine long range reconnaissance aircraft (8 Ju-290s and 1 BV-222) and a few long range Ju-88s available by 22 March. Air Ministry, "The RAF in Maritime War," IV, 464-465.

⁴⁹ Hessler, The U-boat War in the Atlantic, III, 51, 56.

Transit Area, since until the end of April nights were still sufficiently dark and long to allow a submarine to recharge its batteries on the surface during the hours of darkness. Since the overwhelming majority of aircraft patrols in the area were carried out in daylight, the twenty-five U-boats in the area during March and April were able to avoid detection by aircraft.⁵⁰

The squadron's flying for the first part of March was divided between operations, training, and exercises. By 4 March, however, only 20 practice bombs were left on the station, and no more were expected for another three weeks which put an end to important practice. The squadron was also attempting to acquire an air compressor from the Americans at Keflavik, and operational equipment such as flame dampers, radios, and Leigh Lights from the British.⁵¹ The Leigh Lights and flame dampers were essential equipment for nighttime patrols, a role for which the squadron was being considered and which is discussed below. Other modifications were also being proposed for the squadron's aircraft. The armament section was engaged in devising a new ammunition feed for the front guns of the Canso "A". The ammunition feed system for the front guns, which had been initially developed to use flexible feed chutes, was described as "very impracticable and only . . . approximately 20% effective in accomplishing what they were designed for."⁵² The guns sometimes took up to half an hour to load because the ammunition had to be pulled through the flexible feed tubes which were then attached to the guns. The tubes also often caused ammunition stoppages when they buckled or when the strain of pulling ammunition through the tubes proved too much for the machine guns. The tubes limited the arc of fire of the guns, and also damaged the ammunition feed chutes on

⁵⁰ Air Ministry, "The RAF in Maritime War," IV, 483. See Appendix D for flying hours in the Northern Transit Area between January and May 1944.

⁵¹ 162 (BR) ORB, 1-4 March 1944. The Leigh Light was an extremely bright searchlight used to illuminate surfaced submarines that had been detected at night by ASV. In Catalinas, it was mounted under the wing.

⁵² *ibid.*, March 1944, Appendix F, "Ammunition Tank Modification for Twin Nose Guns on Canso 'A' and Catalina Type Aircraft," 1. See chapter 4 of this thesis for a discussion of the initial nose gun installation program.

the sides of the weapons when they buckled. Not only was welding eventually required to repair the damage, but temporary in-flight repairs necessitated the unloading and reloading of the guns in order to bend the damaged chutes back into position. The ORB noted that “having to unload guns while on patrol is very serious.”⁵³ Reloading the guns could take up to half an hour, and fixing the ammunition feed chutes would require additional time. Considering that the front mounted machine guns on the Canso were essential for flak suppression, the need for a modified ammunition feed system was apparent. If the nose guns of a Canso on patrol needed to be unloaded and then reloaded to repair bent ammunition chutes, the aircraft would be extremely vulnerable to flak should it sight a U-boat and make an attack with those weapons out of service or if they should jam during the attack.

The squadron’s solution was to mount the ammunition tanks directly on the machine guns. Not only did this avoid jams due to the flexible feed tubes, but it also increased the arcs of fire for the guns and permitted reloading in a matter of a few seconds. Although each tank held only 250 rounds as compared to the approximately 400 rounds of the previous tanks, the ease of replacement made them far more effective, especially if ammunition expenditure in combat required that the tanks be changed. It was first tested on 4 March, and as a result the guns were “more easy to handle and feed is smoother.”⁵⁴ Interestingly, the initial version of the twin nose guns for the Canso mounted the ammunition tanks directly on the machine guns; the use of flexible feed tubes and larger ammunition tanks was a subsequent modification that was approved by the Air Staff at

⁵³ *ibid.*

⁵⁴ *ibid.*, 1-2; AOCinC, EAC to AFHQ, “Catalina/Canso/Canso “A” - T.E.O. E.1/40/57 - Twin Bow Gun Installation,” 26 November, 1943, NAC RG 24, vol. 5396, file HQS.60-3-12 vol. 5, “PBX Flying Boats”; 162 (BR) ORB, 4 March 1944. The greater ammunition capacity of the tanks used with the flexible tubes may have been a factor in the decision by EAC’s Air Staff to adopt them.

Eastern Air Command Headquarters.⁵⁵ It is not clear, however, whether or not the modification proposed by the squadron was made to all of its aircraft.

While the squadron had been occupied with establishing itself in Iceland and carrying out operations in the face of shortages, it had been neglecting other areas. On 10 March G/C Moreton, the Commanding Officer of RAF Station Reykjavik conducted an inspection of Camp Maple Leaf. Due to an oversight caused by the pressure of work, the squadron's OC, W/C Chapman, was not notified of the inspection until fifteen minutes beforehand. As a result, no preparations had been made for the inspection, which "definitely displeased" G/C Moreton. Beds had not been made up, paper and trash was found in the huts and areas around them, and personnel failed to come to attention when the CO was passing through. On the other hand, it was noted that the airmen's kitchen and dining halls were very clean and were being improved by personnel. Maintenance of the squadron's buildings, however, required some attention. The ORB noted with some justification that

without trying to minimize or pass the buck for mistakes and disorders mentioned above, it is pointed out that this Sqn. operating as it is, in new surroundings, with shortage of 129 personnel, has but two courses to follow. The one which we are following is that of putting every effort into maintenance and operation of our A/C, training of aircrew and carrying out of operations. Our secondary effort is comfort, convenience of living and recreation.⁵⁶

The inspection was continued the following day, and included facilities such as the theatre, various offices, and the maintenance sections. At the latter, the squadron's maintenance problems were discussed.⁵⁷

The squadron had had difficulties with maintenance since its arrival in Iceland, both because of a lack of equipment and a lack of personnel. Until the arrival of necessary maintenance equipment on the *Eskimo* on 25 January, work proceeded slowly "because it

⁵⁵ For correspondence relating to these modifications, see NAC RG 24, vol. 5396, file HQS.60-3-12 vol. 5, "PBY Flying Boats".

⁵⁶ 162 (BR) ORB, 10 March 1944.

⁵⁷ *ibid.*, 11 March 1944.

was necessary to beg, borrow or steal tools and building material.”⁵⁸ By early February, the squadron’s maintenance equipment had been unloaded from the *Eskimo*, but there was still a shortage of maintenance personnel as well as inadequate hangar facilities. The hangar provided for the squadron could accommodate five Cansos at the most, but the presence of an RAF Liberator under repair in the back of the hangar reduced its capacity to three. This hangar also lacked heating and adequate lighting due to the shortage of power on the base and a complete lack of windows. At Iceland’s northern latitudes, a shortage of artificial light in the middle of winter would have severely hindered aircraft maintenance. There were also no offices or workshops in the hangar when the squadron arrived, although the maintenance crews began to rectify this omission soon after their arrival. The lack of motor transport, necessary for access to Station and squadron stores and the Station workshops run by the RAF also complicated maintenance tasks.⁵⁹

Out of the squadron’s fifteen aircraft, three were available on an average day in February. Although the squadron was still operating with less than half of its maintenance personnel, longer hours of daylight, better lighting in the hangar, and the organization of maintenance personnel into crews increased daily serviceability rates by the first part of March. Aircraft flying times were also planned in advance in order to avoid several aircraft requiring major inspections or servicing at the same time. In early March, it was decided that major servicing and engine changes would be undertaken by the squadron in Reykjavik rather than at Gander, which had been specified by the squadron’s movement orders. Time expired engines, which required major inspection and overhaul, were to be exchanged for new engines from the United Kingdom at an initial rate of four per month. The squadron’s ORB explained that “this decision was reached to preclude the possibility of Squadron

⁵⁸ *ibid.*, March 1944, Appendix C, “Maintenance,” 1.

⁵⁹ *ibid.* The Liberator had been in the hangar since sometime in 1943 and was not removed until early September 1944. *ibid.*, September 1944, Appendix K, “Maintenance Report for September, 1944”.

aircraft becoming widely dispersed again.”⁶⁰ Considering the squadron’s experience of the move to Iceland and the delays that flights to and from Canada would cause, such a concern was reasonable.

The arrival of the remaining personnel coupled with the factors above undoubtedly contributed to the increased average daily serviceability in March, which stood at six aircraft, double the availability of February. In addition to regular planned maintenance, aircraft problems that had first appeared during the transfer to Iceland continued to affect the squadron’s Cansos. Some fuel tanks leaked during cold weather, and the starboard engine on Canso “A” 9770 was replaced after an auxiliary drive shaft had seized in flight on 12 March. The aircraft was on patrol at the time of the failure and was forced to return to base, but the affected engine continued to operate until the end of the flight.⁶¹ Despite its full complement of personnel, the squadron’s maintenance section continued to face problems, mainly because of the lack of proper equipment and facilities. The shortcomings of the squadron’s only proper hangar have already been mentioned, but other problems existed. The squadron had also been provided with a nose hangar, which gave minimal overhead cover and was useful mainly because of the two adjacent sheds and a Nissen Hut, which sheltered the Engineering Officers, Maintenance Control Room, and Electrical and Instrument Sections respectively. The nose hangar’s power supply was 60 cycle at 110 volts, the North American standard, while the hangar was wired for 50 cycles at about 220 volts, the British standard, yet another complication for the squadron.⁶² The squadron lacked an air compressor, and was forced to borrow the RAF’s unit, the only compressor on the station. If the RAF’s compressor was not available, the US Army’s unit could

⁶⁰ Aircraft that required 400 hour checks were to have been flown to No. 19 Sub-Repair Depot at Gander. “Eastern Air Command Movement Order No. 25,” 14 December 1943, 2, DHist 181.009 (D274); 162 (BR) ORB, March 1944, Appendix C, “Maintenance,” 1.

⁶¹ *ibid.*, March 1944, Appendix C, “Maintenance,” 1-2; *ibid.*, 12 March 1944. The Maintenance Report states incorrectly that the failure occurred on 13 March.

⁶² *ibid.*, March 1944, Appendix C, “Maintenance,” 2-3. The nose hangar was built by a USN construction battalion, which would explain the difference in electrical service. Roscoe Creed, PBY: The Catalina Flying Boat, (Annapolis: Naval Institute Press, 1985), 189.

sometimes be borrowed. "It is not uncommon," the maintenance report for March noted, "to have a job held up for half a day for want of compressed air."⁶³ Equipment for testing spark plugs and for other trades was also either inadequate or in short supply. Spare parts, which had to be brought in from Canada, threatened to become a problem, since the squadron had received no indication of if or when the parts would be delivered. Furthermore, parts which had been requested in the original demand for a six month supply of spares prior to the move to Iceland had not yet been delivered to the squadron. Many tradesmen were also missing commonly used tools from their kits, but despite requests, the squadron had not yet received replacements.⁶⁴ Delays were also caused by the fuelling tenders on the station. Often only one or two of the four were serviceable, and they were frequently busy due to the demand for their services and their slow pumping rate of approximately twenty-five gallons per minute. Since a Canso fitted with operational equipment carried approximately 1,200 gallons of fuel, this meant that the full fuelling of an aircraft with empty tanks could take at least forty-eight minutes, and even partially full tanks would take a considerable length of time to fill.⁶⁵

During his inspection on the 11th, the Station CO had examined another of the squadron's developments. Lindholme Gear, an Air-Sea Rescue (ASR) device, had been set up in the blister of one of the Cansos for air dropping, and it was successfully tested in Canso 9841 the following day. It had previously been held that Catalinas could not carry the gear, which was an important piece of ASR equipment.⁶⁶ An American Flying Fortress

⁶³ 162 (BR) ORB, March 1944, Appendix C, "Maintenance," 3.

⁶⁴ *ibid.*

⁶⁵ *ibid.*, March 1944, Appendix C, "Maintenance," 3; *ibid.*, 26 March 1944.

⁶⁶ *ibid.*, 11-12 March 1944, March 1944, Appendix B, "Service Training Report," 2.

Lindholme Gear, developed at RAF Lindholme, used a series of five containers joined by a brightly coloured buoyant line. The largest contained an eight-man rubber dinghy which automatically inflated when withdrawn from the container, and the other four containers held food, clothing, medicines, signalling equipment, and other stores. The floating line made it easier for survivors in the water to paddle towards or drift onto the equipment. The entire assembly weighed 212 pounds and was dropped in a sequence so that the containers and line would be stretched along a considerable distance. Stephen Brewster Daniels, Rescue from the Skies: The Story of the Airborne Lifeboats, (London: HMSO, 1993), 5.

ditched forty miles south of Reykjavik on the night of 12/13 March, and one of the squadron's Cansos was sent out on the 13th with the newly proven Lindholme Gear. A deflated dinghy was sighted, but there was no sign of any survivors in addition to the four who had already been rescued. Another mercy mission was flown the same day, when Canso 9841 flew an American Army doctor and nurse to the eastern coast of Iceland to pick up a seriously injured American, although ice forming on the Canso, which had made a water landing, prevented their return until the following day.⁶⁷

The squadron's personnel problem was brought to an end as more squadron members arrived on 12 March, when five Dakotas carrying seventy personnel arrived, with two more arriving the following day. The 14th also witnessed the arrival of nineteen more personnel via 10 (BR) Liberator from Gander. This is the last such arrival referred to by the ORB, although the appendix describing the move claims the last group of personnel arrived on 31 March. The total number of arrivals by the 14th does not agree with the number of absent personnel, which tends to support the assertion that the last flight arrived on the 31st.⁶⁸

In the meantime, W/C Chapman had left for London on the morning of 12 March to attend a Coastal Command conference for squadron OCs on the 17th and 18th. Squadron Leader Poag assumed temporary command in the meantime, and during the almost two weeks of W/C Chapman's absence the squadron underwent yet more changes. On 15 March, the squadron was notified of two improvements in its technical and operational capabilities. The first was notification by Coastal Command that new P4M compasses were on their way to the squadron, and that Dead Reckoning (DR) compasses might also be supplied. By the end of the month 15 DR compasses had been delivered to the squadron and were being installed in its Cansos. By eliminating the necessity of swinging aircraft compasses in the air, considerable amounts of flying time would be freed up for

⁶⁷ 162 (BR) ORB, 12-14 March 1944.

⁶⁸ *ibid.*, 10-14 March 1944.

training and operations, and aircraft would not be grounded by weather that prevented the air swinging of compasses but still allowed patrols to be carried out.⁶⁹

The other addition to the squadron was brought in news that what was cryptically called "Oscar" would replace one of the four depth charges carried under the Cansos' wings. "Oscar" was the Mark 24 Mine, an air-dropped anti-submarine acoustic homing torpedo that had entered service in May of 1943. Coastal Command had requested through RCAF Overseas Headquarters on 12 February that 162 (BR) carry the Mine, since stocks of the weapon and maintenance facilities were available at Meeks Field and Reykjavik. An RAF maintenance party could be supplied at the latter base until 120 Squadron and its maintenance party moved to Meeks Field, but a shortage of personnel in Coastal Command would prohibit the provision of another maintenance party for 162 after that date, and the RCAF would be expected to provide a replacement maintenance party through Eastern Air Command.⁷⁰

Carrying the Mark 24 Mine affected the time the aircraft spent on patrol. The additional weight of the weapon reduced the fuel that could be carried by Cansos, with the result that aircraft carrying "Oscar" and three depth charges flew thirteen hour patrols while those carrying four depth charges flew the regular fourteen hour sorties. Aircraft continued to carry the four depth charges instead of the Mine and three depth charges as a result of Coastal Command doctrine. From 6 October 1943 onwards, the Mark 24 Mine was only carried on offensive A/S patrols and not in the vicinity of convoys, a policy which Eastern

⁶⁹ *ibid.*, 15 March 1944; March 1944, Appendix B, "Service Training Report," 1. The DR compass consisted of a gyroscopically stabilized magnetic compass. W.L. Gillespie, "First Canadian Flight to the Top of the World," *CAHS Journal*, 31:3 (Fall 1993), 87.

⁷⁰ 162 (BR) ORB, 15 March 1944; Alfred Price, Aircraft Versus Submarine: The evolution of the anti-submarine aircraft, 1912 to 1980, (New York: Jane's, 1980), 133-138; ROYCANAIRF to AFHQ, signal CX.2213, 12 February 1944; Minute from D/AMAS-Ops to A/DAPS, 26 February 1944, NAC RG 24, vol. 6173, file HQ.19-6-30 vol. 2, "Proctor-EAC". Correspondence concerning the formation of the maintenance and loading parties for Iceland can be found in NAC RG 24, vol. 6173, file HQ.19-6-30 vol. 3, "Proctor-EAC" and DHist 181.003 (D442). The RAF maintenance party was posted to the United Kingdom in late July 1944. "Report of Trip to 162 Squadron, Reykjavik, Iceland, 30 August 1944, 2, DHist 181.002 (D481). See Appendix C for a description and discussion of the Mark 24 Mine.

Air Command soon adopted.⁷¹ On 20 March S/L Poag, the squadron's temporary commander, visited the Station Commander, who wanted the squadron's armament section to get accustomed to loading and unloading the new weapon. The Area Combined Headquarters also planned for 162 (BR) to carry another recent advance in anti-submarine warfare: sonobuoys and their receiver.⁷² The sonobuoy consisted of a hydrophone (an underwater microphone) and a radio transmitter. Dropped from the aircraft into the ocean, the sonobuoy lowered its hydrophone twenty feet below the surface, and transmitted the signal it obtained to a receiver in the aircraft. The colour-coded buoys operated on six different frequencies, and allowed a skilled operator to "classify" (identify) a submerged target. Used in conjunction with the Mark 24 Mine, sonobuoys made it possible for aircraft to attack submerged U-boats with some possibility of success. Sonobuoys also allowed the crew of the attacking aircraft to determine the result of an attack, and for this reason Coastal Command decided in June 1943 that their provision for aircraft equipped with the Mark 24 Mine was "an immediate operational requirement."⁷³ Since 162 (BR)

⁷¹ The Mark 24 Mine weighed 680 lbs. as opposed to roughly 250 lbs. for the Mark XI depth charge. "Technical Notes on American A/S Mine - Mark 24," 9 April 1943, 1, PRO AIR 15/450; John Campbell, Naval Weapons of World War Two, (London: Conway, 1985), 94; 162 (BR) ORB, 26 March 1944; HQCC to RAF Iceland, 15 Group, EAC, signal AC.281, 6 October 1943, DHist 181.009 (D1519); HQ EAC to AFHQ, signal A.170, 16 October 1943, DHist 181.009 (D1519). Coastal Command appears to have changed its policy as a result of the battle surrounding convoys ONS 18 and ON 202. Its VLR Liberators were carrying two Mines to offset the possibility of technical failure, but this reduced the load of depth charges to four. As a result, Liberators carrying the Mark 24 Mine were limited to one attack on a surfaced U-boat using depth charges, since the Mine was not to be used against surfaced U-boats. Since U-boats in the vicinity of ONS18/ON202 had remained on the surface to fight back, the Liberators were limited to one attack unless the submarine chose to submerge. Furthermore, since the Mine would home on to any appropriate source of noise, be it submarine or friendly ship, there were restrictions against dropping it within certain distances of friendly surface shipping, despite mechanisms designed to prevent the Mine hitting surface ships (see Appendix C). It was therefore less likely that aircraft on convoy patrol would be able to use the weapon even if the U-boat were to submerge. HQCC to RCAF Ottawa, signal A.141, 24 October 1943, NAC RG 24, vol. 6173, file HQ.19-6-10 vol. 2, "Proctor - EAC".

⁷² 162 (BR) ORB, 20 March 1944.

⁷³ "Expendable Radio-Sonic Buoys, Directional and Non Directional," 10 April 1944, 3, DHist 181.002 (D480); Coastal Command Training Instruction No. 28, "The Use of Sono Buoy Equipment," 9 June 1944, 2, DHist 181.009 (D4594); CinC Coastal Command to Air Ministry, D.Ops(T), "Assessment of Attacks with the Mark 24 Mine," 2 June 1943, PRO AIR 15/450. By July 1944 all of Coastal Command's squadrons carrying the weapon had been equipped with

was to use the new weapon, they were also to use sonobuoys. Unfortunately, the necessary equipment was not immediately available and equipping the squadron with sonobuoys did not begin until late July 1944.⁷⁴

In the meantime, the squadron carried out its usual routine of operational flights and local flying and training, despite occasional snow showers from the 15th to the 19th, but one of the primary concerns at this time seems to have been the lack of beer. This was a source of grievance for the squadron's personnel at a meeting on 17 March, when complaints were made that RAF and American personnel, with whom the canteen was very popular, bought so much beer that the nightly ration of 200 bottles was sold within forty minutes. This was despite sales being delayed until 1900 hours so that squadron members could go to the canteen after dinner and still find beer available. Earlier concerns about smartness of dress and the paying of compliments, some of which had been raised during earlier inspections, were also discussed.⁷⁵ Disciplinary issues arose a few days later, on 25 March, when it came to light that on the night of 24/25 March, ten bottles of liquor had been stolen from the Officers' Mess and two hundred feet of film in the cinema projection room had been ruined. Squadron personnel were confined to barracks until 1200 hours the following day in order to allow a search for the missing liquor, and films were suspended

sonobuoys with the exception of two squadrons flying Handley-Page Halifaxes, who were soon to be re-equipped with Liberators and so did not receive them. Minute from A/U Ops to CSO, "Sono Buoy Equipment," 12 July 1944, PRO AIR 15/564. See Appendix C for a description and discussion of the sonobuoy.

⁷⁴ 162 (BR) ORB, 23 March 1944; "Report of Trip to 162 Squadron, Reykjavik, Iceland: Section B: - Radio Sonic Buoys," 30 August 1944, 1, DHist 181.002 (D481). Coastal Command's first supplies of sonobuoy training equipment were received from the US and consisted of film strips and records, including underwater noises picked up by sonobuoys. Due to technical difficulties the records were re-recorded on different materials before being distributed to Coastal Command squadrons, but the training remained somewhat ineffective. By the end of the war the Coastal Command Anti U-boat Devices School, a centralized training school for instruction on sonobuoys and apparently on the Mark 24 Mine, had been created. Extensive use was made of special training aircraft and synthetic trainers (simulators) during the nine-day course. "Sono Buoy Training and the Coastal Command Anti U-Boat Devices School," Coastal Command Review, 4:5 (May 1945), 16.

⁷⁵ 162 (BR) ORB, 15-19 March 1944.

until the matter was cleared up.⁷⁶ Disciplinary problems would continue to flare up from time to time during the squadron's stay in Iceland.

A combination of weather and the location of the base at Reykjavik prevented three aircraft from flying patrols on 21 March, but three aircraft were on training flights and two on patrol the following day, when the squadron made its first operational flights carrying "Oscar". Problems were experienced with loading the weapon, which was carried so close to the wing that the band used to hoist it into position could not be removed once the weapon was in place. As a result of these problems, one of the squadron's two operational flights on the 22nd was delayed by one and a half hours while "Oscar" was being loaded. Further problems with the weapon caused by cold weather were encountered only a few days later, when it was noted that "a/c held up approx. 2 hrs. due to the fact that standby A/C cannot be bombed with Oscar until actually ordered on patrol. This in effect makes a standby A/C not a standby A/C. . . . Suggest standby A/C be loaded with Oscar and some external system of heating supplied if necessary."⁷⁷

Wing Commander Chapman returned on 24 March from the Coastal Command Squadron Commanders' conference in London on board a 120 Squadron Liberator.

⁷⁶ *ibid.*, 25 March 1944.

⁷⁷ *ibid.*, 21-22, 25 March 1944. This entry shows one of the disadvantages of the Mark 24 Mine. Its battery had to be kept at a temperature of at least 50° Fahrenheit in order to produce full power for twelve to fifteen minutes' running. If the battery reached a temperature of 0° F, the running time would be reduced to about three minutes. In order to maintain the proper internal temperature, a thermostatically controlled heating circuit was operated by the battery. The heater was energized immediately prior to departure on flights that were expected to encounter temperatures below 50° F. Unfortunately, the battery's capacity was diminished by the operation of the heater, falling by about a quarter after ten hours of operation in 0° F surroundings, which reduced running time to about nine minutes. A Mark 24 Mine could therefore not be loaded onto a standby aircraft with the internal heater running because of the reduction in the weapon's range that would result, since it could remain on the ground for hours before being sent on patrol. Likewise, since the battery on the Mine had to be kept at at least 50° F, it could not be loaded on the aircraft and left in the open for hours before the heater was switched on, since the battery's capacity would have been greatly reduced by that time. The squadron's ORB does not discuss any solutions to this problem, but the gradually warming weather must have provided at least a partial solution. "Tactical Procedure - Mark 24 Mine," 10 April 1943, 1, PRO AIR 15/450. The Mark 24 Mine was supposed to be stored at temperatures of at least 75° F. "Technical Notes on American A/S Mine - Mark 24," 9 April 1943, 1, PRO AIR 15/450.

Several points raised at the conference were relevant to the squadron, especially the discussion of radar on the first day. A summary of the conference in the squadron ORB stated that

Mk II Radar is of no practical use (nuisance value only) except as [a] navigational aid. Most Squadrons are equipped with A.S.D. or A.S.G. Catalina's [sic] are now being equipped with Mk VIII A. Prototype installation just under test. Only thirty sets available in C.C. and no hope that this squadron may be equipped for some considerable time.⁷⁸

In a letter to the AOC-in-C of Eastern Air Command, W/C Chapman observed that the squadron's radar and electronic equipment was at a severe disadvantage when compared with the equipment of Coastal Command squadrons. The squadron's lack of modern radar and electronics resulted in its restriction to patrols in areas near Iceland and "more or less unprofitable jobs such as Met. flights, all of which are far less fruitful and not nearly so interesting as the more promising but yet more exacting areas further out requiring Night Patrols and most skillful uses of A.S.V. (Later MK's), E.R.S.B.'s and A.Y.D. or A.Y.F. altimeters."⁷⁹ As a result of the Coastal Command conference and meetings with the RAF in Iceland, Chapman informed EAC that "Coastal Command does realize and does consider this Squadron, (Poorest equipped Squadron with respect to Radar under its command), 'Virtually without Radar.'"⁸⁰

⁷⁸ 162 (BR) ORB, March 1944, Appendix A, "Review of CC Squadron OC's Conference March 17th & March 18th, 1944," 3. ASD was 3 cm. ASV radar, while ASG operated on a wavelength of 10 cm. ASV Mk. VIIIA also operated on a wavelength of 3 cm.

⁷⁹ *ibid.*, March 1944, Appendix D, OC 162 (BR) to AOCinC, EAC, "Radar Improvement for No. 162 Squadron Reykjavik, Iceland," 30 March 1944, 1. Night patrols had become especially important since U-boats had changed from daylight surfacing tactics to maximum submergence tactics, surfacing only at night. Modern radar and Leigh Lights or flares for illumination were essential, and radio altimeters were an important tool for low level flying at night. For a discussion of the development of night tactics by early 1944, see Air Ministry, "The RAF in Maritime War," IV, 473-474.

⁸⁰ 162 (BR) ORB, March 1944, Appendix D, OC 162 (BR) to AOCinC, EAC, "Radar Improvement for No. 162 Squadron Reykjavik, Iceland," 30 March 1944, 2. By March 1944 all Liberator, Halifax, and Wellington squadrons in Coastal Command were equipped with centimetric ASV, but up to April of that year its flying boat and Fortress squadrons were entirely equipped with ASV Mark II. From the middle of April onwards ASV Mark III (10 cm) began to be fitted to Sunderlands. Air Ministry, "The RAF in Maritime War," IV, 472-473.

Coastal Command had in fact already declared ASV Mark II obsolete. In addition to the problems with the Yagi antennas used by the system, described in earlier chapters, German search receivers had rendered metric radar useless as a means of detecting U-boats. Coastal Command aircraft fitted with ASV Mark II used it only for navigation and in conditions of poor visibility. Eastern Air Command operational policy also acknowledged these problems; instructions for the use of ASV Mark II recommended its use only as a navigational aid or when visibility was less than eight miles. Furthermore, for fear of disclosing the location of convoys to U-boats with search receivers, aircraft on close escort of convoys not known to be shadowed by U-boats were not to use ASV Mark II except when necessary to keep in contact with the convoy. The more modern ASG and ASD, however, operating on wavelengths of ten and three centimetres respectively, were not subject to these restrictions, and were to be in operation throughout all kinds of flights.⁸¹

Inquiries by the squadron had determined that Coastal Command would be unable to supply 162 (BR) with more modern radar until all other squadrons had been so fitted and that arrangements should be made through Canada for upgrading the radar and associated electronics systems on the squadron's Cansos.⁸² Unfortunately, as the RCAF official history notes, procurement difficulties had held up the modernization of Eastern Air Command's aircraft in the past, and continued to hold up improvements for other squadrons as well as 162 (BR). The problem of upgrading radar was especially acute for

⁸¹ Douglas, The Creation of a National Air Force, 602; Air Ministry, "The RAF in Maritime War," IV, 473; "Eastern Air Command Operational Instructions, BR Operations - Use of Radar Equipment," 20 February 1944, NAC RG 24, vol. 11464, file "A/S Warfare - Aircraft".

⁸² 162 (BR) ORB, March 1944, Appendix D, OC 162 (BR) to AOCinC, EAC, "Radar Improvement for No. 162 Squadron Reykjavik, Iceland," 30 March 1944. In this letter W/C Chapman compares the equipment of 162 (BR) (ASV Mk. II and ABK-5 IFF) with that of 120 Squadron RAF (ASV Mk. V, Mk. III IFF, AYD radio altimeters, sonobuoy receivers, and the GEE navigational system). On 6 March, Chapman had requested ASV Mk. V, AYD altimeters, sonobuoy receivers, and associated spares from Coastal Command, but as mentioned above, they were unable to supply it. *ibid.*, March 1944, Appendix D, OC 162 (BR) to AOC, RAF Iceland, "Equipment: Radar Improvement No. 162 Squadron," 6 March 1944.

EAC's Cansos, since the more modern ASG and ASD had already been fitted to some of the Command's newer aircraft, the Liberator and Ventura. Unfortunately, weight restrictions prevented the mounting of ASG in Cansos, and initial experience with ASD in the Venturas was less than promising. Furthermore, due to inadequate planning, EAC's technical facilities proved unable to keep up with demands for the fitting of modern radar and radio aids, such as the LORAN navigational system to its aircraft. The official history notes that in 1945 the number of aircraft available for anti-submarine operations actually decreased due to the lengthy waits for refits.⁸³ The result of EAC's inability to modernize its Cansos and other aircraft meant that not only was 162 (BR) poorly equipped in comparison with Coastal Command squadrons, but it was to enter its period of heavy encounters with the enemy without the benefit of modern radar and radio aids.

In addition to hindering effective daylight operations, the lack of modern radar and electronics prevented 162 (BR) from participating in nighttime operations. The imminent arrival of a "daylight" Liberator squadron in Iceland led to a request by RAF authorities in Iceland that 162 carry out patrols on moonlit nights. A meeting had been held on 4 March with G/C Brodie, the Senior Air Staff Officer (SASO), at which time the provision of Leigh Lights, flame dampers,⁸⁴ and other equipment was discussed. As a result of the squadron's outdated radar and lack of radio altimeters and other equipment, as well as the need to practice tactics using flares in lieu of Leigh Lights, it was decided in a conference with the Station CO and the SASO on 28 March that 162 (BR) could make little

⁸³ Douglas, The Creation of a National Air Force, 602; Roger Sarty, "The RCAF's Eastern Air Command, ASV Radar, and Submarine Hunting," unpublished article, 12-13, 15-17. ASB, operating on a wavelength of 50 centimetres, had been chosen as an interim replacement for ASV Mark II in Canso aircraft before 3 centimetre radar was ready. It was not adopted by the RCAF due to supply problems from American sources that delayed its delivery until mid-1944, by which time the 3 centimetre ASD radar was available.

⁸⁴ 162 (BR) ORB, 19, 4 March 1944. Flame dampers on the engine exhausts were necessary for night operations, because without them exhaust flames at night "would be visible to a distance something like two miles." DCAS to CinC CC, 30 January 1942, PRO AIR 15/488. The aircraft of a "daylight" Liberator squadron were not equipped with Leigh Lights or other equipment for nighttime operations.

contribution to nighttime patrols.⁸⁵ The squadron's OC was justified in advising Eastern Air Command that "in future it will be a great mistake to move other Canadian squadrons overseas unless fitted with Radar Equipment on a par with equipment as used in Coastal Command."⁸⁶

Operations and training in the last part of March were routine, with an average of two or three aircraft on operations, and two on local flying and training. Problems with the fuel tenders, complicated by the different fuel loads for aircraft carrying the Mark 24 Mine, interfered with operations. On 26 March an operational aircraft and a training flight were held up indefinitely because a tender was not available. Three days later, an aircraft assigned to a high priority close convoy escort was delayed for the same reason. "This lack of refuelling facilities," the Squadron's Operations Record Book noted, "has caused numerous delays, in testing and making operational of [sic] A/C in this squadron."⁸⁷

Delays in other areas were also causing problems for the squadron. Mail had been a sensitive issue since the squadron's arrival in Iceland. A letter took approximately one month to arrive in Iceland from Canada, and delays of up to two months were not unusual. The ORB recorded on 27 March that "the airmen are very dissatisfied with present poor mail service. . . . Due to the fact that large numbers of aircraft are passing through here on their way to [the] U.K. it is difficult to understand why they are not used to deliver mail to this squadron."⁸⁸ The poor mail service to Iceland would remain a problem for some time to come, and the delivery of cargo would likewise pose problems for the squadron.

Transportation also continued to pose a problem, and the squadron requested a car or jeep

⁸⁵ 162 (BR) ORB, 28 March 1944.

⁸⁶ *ibid.*, March 1944, Appendix D, OC 162 (BR) to AOCinC EAC, "Radar Improvement for No. 162 Squadron Reykjavik, Iceland," 30 March 1944, 3.

⁸⁷ *ibid.*, 26-29 March 1944.

⁸⁸ *ibid.*, 27 March 1944. Some of these aircraft were the MailCan Fortresses of 168 (Heavy Transport) Squadron, carrying mail from Canada to England, which must have made the situation even more exasperating. At least some of the squadron's mail appears to have come to Iceland by ship. "Interview by Roger Sarty with Ray Crone," 13 June 1993, 4, DHist Biographical File.

for the OC, and two more light vehicles for the squadron's Engineering Officer and Adjutant, in order to eliminate delays caused by waiting for transport.⁸⁹

Another problem that became apparent in March was a high incidence of airsickness, with thirty reported cases. Although it was felt that an emphasis on physical fitness and careful selection of food would help mitigate the problem, the primary cause was the Canso "A". Its low airspeed, low wing loading, tendency to wallow in rough air, and the high mounted wing that made the fuselage swing like a pendulum all contributed to airsickness, and the turbulent air often encountered around Iceland only served to exacerbate the problem. An RAF investigation in 1941 had noted that "airsickness occurs more commonly than is supposed among these [Catalina] crews when flying for long hours in rough weather."⁹⁰ The problem was even acknowledged in a series of press releases about the squadron, and the squadron's service training report for March noted that the high prevalence of airsickness would result in a high turnover of aircrew, and that for this reason Coastal Command's policy was to relieve aircrew on completion of an operational tour. The report also stated that sixteen of the squadron's aircrew had either already completed at least one tour or were demonstrating signs of operational tiredness, and asked that a policy on replacement personnel be implemented.⁹¹

By the end of March, 162 (BR) had logged 62 operational sorties, totalling slightly more than 772 operational flying hours, and had flown almost 246 hours of training flights and 20 hours of test flights. In total, just under 1038 hours of flying were carried out, the highest total for the squadron since August 1943.⁹² A second Canso and flight crew had been sent on the anti-U-boat course at Maydown, Northern Ireland, while other squadron

⁸⁹ 162 (BR) ORB, March 1944 Appendix B, "Service Training Report," 2, 4-5.

⁹⁰ *ibid.*, March 1944, Appendix B, "Service Training Report," 2-3; "Factors Influencing Onset and Production of Fatigue in Catalina Flying Board [sic] Crews," 1 September 1941, 5, DHist 90/400.

⁹¹ RCAF Directorate of Public Relations, Release No. 3340, no. 4-5, 5,6 June 1944 (insert in ORB); 162 (BR) ORB, March 1944, Appendix B, "Service Training Report," 2-4.

⁹² *ibid.*, Summary for March 1944.

personnel were on bombing and gunnery leaders' courses in the United Kingdom. Training at Reykjavik was also proceeding at a considerable clip, and was in fact exceeding normal Coastal Command requirements. Since the middle of February, a four day cycle combining training and operations for aircrew had been implemented, which involved ground training on the first day, local flying training on the second, operational flying on the third, and the fourth day off duty. Although weather and aircraft unserviceability sometimes interfered with the schedule, the plans for varied training were generally successful. Testing and hands-on practice supplemented lectures for aircrew, and co-operation and homing exercises were carried out with elements of the Royal Navy.⁹³ This extensive training was to pay off in April when the squadron scored its first success against a U-boat.

April began much as March had ended, with a regular pattern of operational and training flights. The issue of mail delivery was raised with S/L Lavery, who was visiting Reykjavik from EAC about accounting and costs, and he agreed to raise the issue at EAC headquarters.⁹⁴ Physical Training (PT) was expanded to cover a greater range of activities, as crews were sent to the civic swimming pool in Reykjavik and to a nearby skiing area. Trap shooting was also arranged for aircrews on ground training on at least one occasion.⁹⁵ Maintenance, aircraft serviceability, and efficient employment of personnel were the subject of a squadron conference on 4 April. A policy of 1000 hours' flying per month, and six aircraft serviceable daily, four for operations and two for training, was outlined. Since three major and twenty minor aircraft inspections would therefore have to be carried out at

⁹³ *ibid.*, Summary for March 1944, March 1944, Appendix A, "Review of C.C. Squadron O.C.'s Conference," 3, Appendix H, "Returns, Signals (Communications) Narrative Report, Training"; "Interview by Roger Sarty with S.E. Matheson," 14 June 1993, DHist Biographical File.

⁹⁴ 162 (BR) ORB, 1 April 1944, Summary for March 1944. Accounting was a significant issue because of the agreement with the British about the responsibilities for 162 (BR)'s operating costs and the payments associated with them. At least one accounting report, dated 1 February 1945, has survived and can be found in DHist 181.009 (D3410).

⁹⁵ 162 (BR) ORB, 3 April 1944.

Reykjavik during April, a reorganization of maintenance personnel was carried out.⁹⁶ More meetings were held the following evening. At the first, aircrew complaints about rations resulted in the creation of a committee to investigate the matter. The second meeting, a muster parade, was held in the station theatre. W/C Chapman described the past month's work, the squadron's future commitments, and the recently decided policy on the reallocation of work, with personnel working on the jobs to which they are best suited. "People who do not pull their own weight," the ORB recorded, "will supply station details."⁹⁷ Discipline and welfare issues were also raised, and it appears to be at this meeting that dissatisfaction amongst the ground crew with the poor conditions in Iceland came to a head. Slow mail service, unnecessary discipline, and other concerns were mentioned by the groundcrew, and as a result W/C Chapman held a confidential meeting, of which no records were kept, with representatives of the groundcrew.⁹⁸ Most of the problems and concerns, as will be seen, were gradually resolved during the following months.

On 6 April, the squadron suffered its first losses since arriving in Iceland. At 1500 hours, Canso 9809 crashed into the sea two miles northeast of Keflavik. It was carrying eight RCAF crew and two USAAF passengers on a compass swing and radio range practice flight.⁹⁹ Orders went out to divert any of the squadron's aircraft on local flights to search for survivors, and W/C Chapman, S/L Poag, and F/L MacBride and crew took off from Reykjavik for the scene of the crash. By the time they arrived, there was no sign of

⁹⁶ *ibid.*, 4 April 1944.

⁹⁷ *ibid.*, 5 April 1944. The details were responsible for cleanup around the base and other duties.

⁹⁸ *ibid.*, 5 April 1944; "Interview by Roger Sarty with Ray Crone," 13 June 1993, 5-6, DHist Biographical File. In addition to poor RAF food, many RAF personnel regarded the Canadians as "colonials", which naturally strained relations. Many of the complaints of unnecessary discipline seemed to center on a few senior NCOs and some officers in the squadron. *ibid.*; Conversation with C.V. MacLachlan, 27 December 1995, Ingersoll, Ontario.

⁹⁹ Although Dead Reckoning compasses, which eliminated the need for compass swinging flights, had been delivered to the squadron, installation was proceeding slowly, and authorities in Canada had not responded to squadron suggestions that a special work party be provided to make the installations. 162 (BR) ORB, 26 April 1944.

the lost aircraft save a “smudge” on the water, but a ship, a trawler, and some smaller vessels were picking up survivors in the area. Eight survivors were taken by sea to Keflavik and from there to the US Army hospital for the area. Neither F/O J.R.M. Rankine, one of the Canso’s pilots, nor P/O J.F.V. Banning, one of its Wireless Air Gunners, was among the survivors. The other pilot, F/O C.C. Cunningham, the flight engineer, F/S R.B. Bamford, and the navigator, F/O W.D. Coffyn, were seriously injured. The crew’s remaining WAGs, WO2 J. Somerville, Sgt. L.A. Dumbell, and Sgt. G.L. Gratton, as well as Lt. Kappus and Sgt. Anklam, the two American passengers, were only slightly injured.¹⁰⁰ Banning, Coffyn, Somerville, and Gratton had all been with Cunningham during the attack made on 22 February. The following morning, F/O Cunningham required a blood transfusion and personnel with the appropriate blood type were found and taken to Keflavik. By that afternoon, the conditions of Cunningham, Bamford, and Coffyn were reported as critical, and F/L Davidson, the squadron chaplain, visited the hospital that evening. Cunningham and Bamford were in particularly critical condition, and the latter died early on the morning of 8 April. By the following day, Sunday, only WO2 Somerville and Sgt. Dumbell were able to see the squadron OC and other visitors to the hospital; the condition of the others did not permit visitors. Flight Sergeant Bamford’s funeral was on 12 April. Services were held in the camp theatre, with a funeral parade to the cemetery a mile away. In addition to the effect of the crash on the squadron’s personnel, the accident had left the squadron short of aircrew and short one airplane, and a signal was sent to EAC requesting replacement personnel and aircraft, as well as spares that were required.¹⁰¹

¹⁰⁰ *ibid.*, 6 April 1944, April 1944, Appendix A, “Accident to Canso ‘A’ aircraft, on 6 April 1944”. The records of the court of inquiry into the accident have not been found, and the Accident Investigation Branch report does not appear to be among the microfilmed collection of reports at the National Archives of Canada. As with other crashes, the “crash card” file at the Directorate of History is currently unavailable to researchers because it is being computerized.

¹⁰¹ *ibid.*, 7-8, 12 April 1944. F/L Davidson, the squadron chaplain, had held his first service at Camp Maple Leaf on 19 March, and the ORB noted that “he will be a most effective man in the squadron, he delivers a powerhouse of a sermon.” *ibid.*, 19 March 1944.

In the meantime, squadron's operations continued. Discussions in March about night patrols were now showing results, and on the night of 6/7 April two night tactics training flights were carried out. The following night, two sweeps were carried out, but few others occurred during the month. Since the squadron's aircraft were not fitted with Leigh Lights for night operations, flares would have to be used, and discussions were held with members of both the RAF and the USN about procuring flares, flame floats, and other pyrotechnics necessary for nighttime operations. Even when such flares were available, the Cansos lacked the chutes or racks necessary to carry the two million candlepower flare. Underwing carriers were proposed, but in the meantime it was suggested that they be carried in the aircrafts' blisters. Another nighttime patrol was carried out on the night of 13/14 April, and this appears to be the last night patrol in April, although some additional night training flights were carried out.¹⁰²

On 8 April one of the squadron's Cansos was called out on another Air-Sea Rescue (ASR) flight, when a USAAF P-40 crashed about five miles southwest of the airport. While it may seem unusual that the squadron was called upon for ASR duties when 279 Squadron, whose Lockheed Hudsons carried Airborne Lifeboats, maintained a detachment in Iceland from at least late March onwards, the mounting of Lindholme Gear in 162's Cansos and their longer range than 279's Hudsons meant that they played an important role in ASR. The Canso's amphibious capabilities also meant that some rescue missions and mercy flights could only be carried out by 162 (BR).¹⁰³ Although there were occasional calls for ASR work and trial efforts at night patrols, the majority of the squadron's effort remained focussed on daytime operations and training. The reorganized maintenance system that had been discussed at the muster parade on 5 April was implemented on the

¹⁰² *ibid.*, 6-8, 13-15 April 1944, April 1944. The flare was a slow falling parachute flare that delivered two million candlepower for fifty to seventy seconds. Air Ministry, "The RAF in Maritime War," IV, 474, n. 1.

¹⁰³ 162 (BR) ORB, 8 April 1944; Daniels, Rescue from the Skies, 185; Air Ministry, "The RAF in Maritime War," IV, App. 1, 15, "Coastal Command Order of Battle, Strength and Availability, 28 March 1944".

11th, with the aim of more consistent and reliable serviceability. The squadron exerted a considerable flying effort, with that of 13 April being especially notable. Four aircraft were on daylight patrols for a total of almost forty-eight hours, one aircraft on night patrol for fourteen and a half hours, and seven aircraft on local flights and test flying for a total of just over twenty hours. Slightly more than eighty-two and a half hours had been spent in the air that day by 162 (BR)'s Cansos.¹⁰⁴

The second of the squadron's crews returned from the A/S course in Maydown on the 13th, and aircrew had been heading to and from the United Kingdom on leave, in co-ordination with transit patrols to and from the British Isles. For the first time since the beginning of the month, weather interfered with flying. On 15 April, snow and low cloud limited the squadron's flying to one patrol. Snow washed out local flying on the following day as well, and one of the Cansos was diverted to Ballykelly due to weather conditions.¹⁰⁵ The weather relented on the 17th, and three aircraft were out on operations. Among them was Canso "A" 9767, flown by F/O T.C. Cooke and crew, which was on a combined Creeping Line Ahead sweep and meteorological flight to the southwest of Iceland.¹⁰⁶ In the late morning, with the aircraft flying a course of 204° at 800 feet, the sky was half covered in clouds from 2,000 feet upwards, and visibility was twenty-five miles over a moderate sea. The co-pilot, F/O B.F. Hunter, sighted a wake at Green 45°, distant six miles, and Cooke altered course to investigate. When the range closed to four miles, binoculars identified a U-boat on the surface, heading 330° at ten knots. The Canso began its run-in from out of the sun, but was spotted by the U-boat's lookouts, since the submarine's anti-aircraft guns opened fire when the attacker was 3,000 yards away. Cooke turned to starboard, taking evasive action by flying the Canso in an undulating path, and closed the

¹⁰⁴ 162 (BR) ORB, 11-13 April 1944.

¹⁰⁵ *ibid.*, 11-16 April 1944.

¹⁰⁶ The crew consisted of F/O T.C. Cooke, pilot, F/O B.F. Hunter, co-pilot, F/L E.W. Wiskin, navigator, F/O P.P. Ficek, 1st WAG, WO2 G.R. McMacken, 2nd WAG, F/S N.C. Tilander, 3rd WAG, Sgt. E.S. Hill, engineer, Sgt. T.E. Hooson, engineer, and F/S E.A. Johnson, RAF meteorological observer.

range to 1,200 yards, at which point he turned to port and made a beam attack on the U-boat. Light flak was bursting all around the aircraft, but no hits were scored. As soon as the turn for the final run-in was made, the aircraft's nose gunner opened fire, scoring hits around the submarine's conning tower. At 300 yards the submarine stopped returning fire, although three men were seen in the conning tower as the aircraft passed overhead at 147 miles per hour.¹⁰⁷

Crossing the U-boat at right angles from starboard to port fifty feet above the water, three Mark XI Torpex depth charges fell from the Canso. The first detonated close to the submarine's starboard side, with the second and third falling to port. Emerging from the plumes of the explosions, the U-boat made a half-circle to starboard at about twelve knots, then began to turn to port, gradually sinking lower in the water. The Canso was circling to port after the attack, firing a total of 800 rounds at the submarine from its port blister. Nine minutes after the attack, the U-boat had slowed to six knots at about conning tower depth and seemed about to submerge when a "violent explosion" occurred some fifteen feet forward of the conning tower. A plume, "resembling that of a depth charge," rose on both sides of the U-boat, which sank instantly. The aircraft, which had completed almost two circles around the stricken sub, turned hard to port and attempted to deliver an attack with its Mark 24 Mine, but the weapon hung up, and two further attempts to drop it also failed.¹⁰⁸

Wreckage appeared where the U-boat sunk, and "many pieces resembling orange and reddish pieces of wood" appeared over an area about 100 yards on a side, but no

¹⁰⁷ "Green 45°" means forty-five degrees to starboard. Green indicates a bearing to starboard, Red a bearing to port. RCAF Coastal Command ORB, April 1944, App. E, Form UBAT, DHist 181.003 (D886); "U/Boat Attack Assessment Form, Serial No. 1024," 17 April 1944, PRO AIR 15/137; "Precis of Attack by Canso Aircraft 'S' of 162 Squadron," 1 May 1944, NAC RG 24, vol. 5211, file HQS.17-162-9, "No. 162 (BR) Squadron - Operations"; Norman Franks, Search Find and Kill: Coastal Command's U-boat Successes, (Bourne End: Aston, 1990), 140.

¹⁰⁸ RCAF Coastal Command ORB, April 1944, App. E, Form UBAT, DHist 181.003 (D886); "U/Boat Attack Assessment Form, Serial No. 1024," 17 April 1944, PRO AIR 15/137; "Precis of Attack by Canso Aircraft 'S' of 162 Squadron," 1 May 1944, NAC RG 24, vol. 5211, file HQS.17-162-9, "No. 162 (BR) Squadron - Operations".

survivors were observed. Two “large cylindrical objects” were also seen amongst the wreckage. One, which was open at one end, sank in two minutes, while the other, which seemed to be made of shiny metal, was still afloat when the aircraft left. Air bubbles four to eight feet in diameter rose near it for about an hour afterwards. Cooke and his crew remained in the area for five hours and forty minutes after the sinking, dropping smoke floats to mark the site. Traces of light oil were seen on the surface along with the wreckage, and three hours after the attack heavy dark oil began to appear on the surface upwind from the wreckage which had begun to drift away. At first measuring 600 by 250 yards, after an hour and a half the slick had grown to 3,000 by 600 yards. Canso 9841 was homed to the scene of the attack, with Liberator H/86 arriving later. Five hours and forty minutes after the attack, Cooke and his crew set course for Reykjavik.¹⁰⁹

As a result of the visual and photographic evidence, the attack was assessed as “probably sunk”. Peyton-Ward at Coastal Command described it as “an exceedingly good attack after an intelligent and determined approach in face of flak. . . . The internal explosion . . . seems to have disintegrated the U/B [U-boat],” while K.B. Lloyd, the Air Staff member at the Command described it as “a model attack in every way. The crew are congratulated on their courage and skill in the face of flak.”¹¹⁰ The assessment by Coastal Command Headquarters was “U-boat probably sunk.” On 29 August 1945, the Admiralty Assessment Committee identified the U-boat sunk by Canso “A” 9767 at 60° 23’ N, 29° 20’ W in 700 fathoms of water. It was *U-342*, a Type VIIC submarine on its first patrol. Commanded by Oberleutnant Albert Hossenfelder, the submarine had left Bergen, Norway, on 2 April. Like the Canso, *U-342* had been engaged in weather reporting duties, and was one of the very few U-boats operating west of the British Isles in April following the withdrawal of U-boats from the central Atlantic and the cancelling of operations against convoys on 22 March. Unlike Cunningham’s attack in February, this

¹⁰⁹ *ibid.*

¹¹⁰ “U/Boat Attack Assessment Form, Serial No. 1024,” 17 April 1944, 2, PRO AIR 15/137.

attack does not appear to have been the product of Allied intelligence. Although they were aware of the weather-reporting U-boats and their mission, largely through Enigma intercepts, no concerted long-term effort to hunt down and destroy the boats was made, although *U-248* was destroyed by United States Navy ships using communications intelligence on 16 January 1945. In addition to *U-342* and *U-248*, only three other weather-reporting U-boats out of a total of fifty-one were lost, a low loss rate in comparison with the overall U-boat loss rate during the war.¹¹¹

This attack demonstrated the benefits of the squadron's training program. F/O Cooke and crew had just returned from the anti-submarine course at Maydown, Northern Ireland, on 13 April, and the practice attacks on the "tame" submarine had undoubtedly paid off in the accurate placement of the three depth charges in both line and range.¹¹² The 500 rounds fired from the front-mounted guns on the *Canso* appear to have been effective in silencing the U-boat's flak, since none was experienced after the initial run-in before the depth charges were dropped. It should be pointed out, however, that although there was light flak from the two twin 20mm cannon on the upper "bandstand" on the conning tower, no gunfire was actually seen from the 37mm cannon on the lower "bandstand".¹¹³ The heavy flak may have been silenced by machine gun fire, but it is also possible that the

¹¹¹ RCAF Coastal Command ORB, April 1944, App. E, Form UBAT, DHist 181.003 (D886); Admiralty Assessment Committee, "Re-Assessments: Attacks Previously Assessed 'Probably Sunk' for which a U-boat Casualty has been Established," 29 August 1945, 1, PRO AIR 15/306; Franks, Search Find and Kill, 140-141; Hessler, The U-Boat War in the Atlantic, III, 56; Roskill, The War at Sea, III, pt.1, 258; David Syrett, "German Meteorological Intelligence from the Arctic and North Atlantic, 1940-1945," The Mariner's Mirror, 71:3 (August 1985), 325-333. The other three weather-reporting U-boats lost were *U-877*, *U-1226*, and *U-1276*.

¹¹² 162 (BR) ORB, 11, 13 April 1944; "Interview by Roger Sarty with S.E. Matheson," 14 June 1993, 2, DHist Biographical File; "U/Boat Attack Assessment Form, Serial No. 1024," 17 April 1944, 2. Aiming errors were measured by referring the centre of the "stick" of depth charges to the the conning tower of the U-boat. Range errors measured the displacement of the stick centre in the direction of flight, while line errors measured the displacement of the stick centre at right angles to the direction of flight. C.H. Waddington, O.R. in World War 2: Operational Research against the U-boat, (London: Elek Science, 1973), 171. See chapter 7 of Waddington for an thorough discussion of the technical aspects of aircraft depth-charge attacks on surfaced U-boats.

¹¹³ RCAF Coastal Command ORB, April 1944, App. E, Form UBAT, DHist 181.003 (D886).

37mm automatic AA gun was out of service due to production faults, which were relatively common with this weapon at this time.¹¹⁴ Problems with weaponry were also apparent in the Canso, since the Mark 24 Mine had failed to drop on three separate attempts. Despite this failure the sinking of *U-342* augured well for the aircrew of 162 (BR) and their aircraft, although events in June were to uncover deadly faults with the latter.

Cooke and his crew underwent a three hour debriefing on the following day, and the AOC Iceland advised that Cooke be recommended for an immediate award of the Distinguished Flying Cross (DFC). The award was made and was announced in the *London Gazette* on 30 May 1944, and F/L E.W. Wiskin, the navigator, was also awarded the DFC on 2 October of the same year.¹¹⁵ Cooke described the attack, as well as the anti-submarine course at Maydown, in a lecture to the aircrew given on 23 April. In the interim, flying operations continued as usual. The evidence in the aftermath of *U-342*'s sinking was sufficiently conclusive that no great effort seems to have been devoted to followup patrols in the area of the attack as had been done in the aftermath of the attack on 22 February.¹¹⁶

Flying was curtailed on 19 April, when crosswinds prevented operational aircraft from taking off with a full load of fuel. Approximately 400 gallons of fuel had to be removed from each aircraft before they could safely take off from the runways at Reykjavik. The Cansos then had to fly to the American air base at Meeks Field in order to fully fuel up before heading out on patrol. The winds were so severe that even two aircraft on local flights had to be defuelled before they could take off. Aside from the

¹¹⁴ Hessler believes that all U-boats were equipped with the 37mm automatic AA gun after December 1943. Poor materials and manufacturing problems with the weapon led to widespread flaws with the automatic system frequently breaking down. Hessler, *The U-Boat War in the Atlantic*, III, 33-34, 54. Rössler agrees with Hessler on the armament of U-342. Rössler, *The U-boat*, 335.

¹¹⁵ Cooke's was awarded the DFC for the destruction of *U-342*, while Wiskin's citation described his efficiency as navigator as well as his role in the attack. The author wishes to thank Hugh Halliday for providing a list of honours and awards for 162 (BR) Squadron from the extensive list he is compiling. The awards and medal citations in this thesis are taken from this list.

¹¹⁶ 162 (BR) ORB, 17-23 April 1944.

inconvenience of the procedure, there was also the risk that the time it consumed could be crucial in case of an emergency, especially when 162 (BR)'s role as local ASR squadron is considered. The problem was aggravated by the inadequate bowsers (fuel trucks) on the station. The squadron had been dealing with inadequate fuelling facilities since its arrival, and this was another example of the problems and delays caused by inadequate equipment. The bowsers took at least 45 minutes to remove the 400 gallons of fuel, and the ORB noted that the squadron needed fuelling facilities that were capable of a much greater rate of fuelling and defuelling.¹¹⁷

The problems with aircraft fuelling were eclipsed by breaches of discipline among squadron personnel on the night of 22/23 April. Although 162 had already experienced disciplinary problems during its stay in Iceland, and would experience problems again in the future, the second event this night was probably the most severe breach of discipline that would be encountered. In the evening, RAF personnel were seen removing beer from the Airmen's Canteen, which was closed after they were ordered to return it. The more serious event occurred in the early morning of the 23rd, when a fight in the NCO's Club resulted in the knifing of one of the squadron's Flight Sergeants, who was rushed to hospital. The WO2 apparently responsible was placed under arrest. The squadron's OC, Wing Commander Chapman, addressed a squadron muster parade that evening about future policies towards disorder and breaches of discipline. The Airmen's Canteen was closed for a week, while the NCO's Club was not allowed to serve beer or liquor during the same length of time. In addition, both the NCOs' and Officers' messes were forbidden to host dances during the following week. Either in spite of or because of the crackdown on discipline, three armourers were placed on charge on the 24th for failing to carry out their daily inspections. Two airmen were confined to barracks for fourteen days and a

¹¹⁷ *ibid.*, 19 April 1944. This potential problem with the runways had been noted earlier, but it was thought that the squadron's Cansos would not be affected by it. *ibid.*, summary for Reykjavik, January 1944

corporal was given a reprimand. Actions were also begun to have “doubtful characters” posted elsewhere. Keeping groundcrew grievances at the beginning of the month in mind, however, discipline in future was to be “strict but not irksome.”¹¹⁸

The burden of maintenance that had been assumed by the squadron was lightened in late April when a decision was taken to send two aircraft per month to Canada for major inspections, beginning on 8 May. The squadron had already suggested in March that as weather over the North Atlantic improved, aircraft might be flown back to Gander, Newfoundland, for major inspections without fear of major delays being caused by the weather. Eastern Air command agreed to the plan on 28 April, when plans were made to prepare two aircraft for ferrying to Iceland, and to ship two engines to Reykjavik by air.¹¹⁹ These arrangements freed up the squadron’s maintenance personnel to carry out minor inspections and regular maintenance instead of time-consuming major inspections, which would allow higher rates of serviceability.

The weather closed in again on 26 April, when both operational and training flights were recalled due to rain squalls. One of the recalled aircraft taxied off the pavement and became stuck in the soft ground off the pavement, requiring considerable work to remove and then to check the landing gear. Heavy winds during the night rocked three aircraft back on their keels, fortunately without causing damage. The persistent overcast during April resulted in gradually increasing aircraft unserviceability. The Cansos required compass swings after every minor check, and these swings could only be carried out with good visibility. Since 12 April there had been only two clear days. Although Dead Reckoning compasses, which did not require air swinging, had been received from the RAF in March, their installation was proceeding slowly, apparently because none of the squadron personnel were trained in their installation and maintenance. The squadron had

¹¹⁸ *ibid.*, 22-24 April 1944, summary for April 1944.

¹¹⁹ *ibid.*, 25 April, March 1944, Appendix B, “Service Training Report,” 4; Memorandum from A/D/AMAS-Ops to AMAS, “Unserviceability No. 162 Squadron,” 28 April 1944, NAC RG 24, vol. 5211, file HQS.17-162-9, “No. 162 (BR) Squadron - Operations”.

suggested that an installation party be sent from Canada, but had not yet received any response from Canadian authorities.¹²⁰

Although the weather interfered with flying once more in April, it had improved sufficiently that preparations were made for training in water landings and handling. The dangers of ice formation on the Cansos during the winter had prevented such training earlier in the year. These icing conditions had interfered with a mercy flight on 13-14 March, and had led to a decision not to carry out any water landings in cold weather since the icing could prevent a Canso from taking off. By the end of April, the weather had warmed up enough to allow training in water operations to be considered. Weather on the last day of the month was sufficiently improved that a softball game between officers and airmen was held in the evening, with the officers winning 14-13 in nine innings.¹²¹

April witnessed both tragedy and triumph for 162 (BR). The loss of three aircrew and a Canso in a crash on 6 April was soon followed by the sinking of *U-342* on the 17th. The squadron recorded a creditable flying record as well. A total of 995 flying hours was recorded for April, 100 hours more than was recorded by either of the two RAF Liberator squadrons at Reykjavik. Operational flying consumed just over 713 hours during 55 sorties, while slightly more than 231 hours of flying was devoted to training flights, with the remainder of the flying time occupied by tests and other flying. Plans for even greater operational effort were already under consideration. When the weather improved sufficiently to permit major inspections in Canada, expectations were that the squadron could carry out 1200 to 1400 hours' flying per month. The improving weather was also bringing a reduction in airsickness that had been a problem since arrival in Iceland.¹²²

May began with the arrival of two much-needed engines and accessories on a Dakota of 164 Squadron RCAF. Canso "A" 9769 was undergoing a major inspection and

¹²⁰ 162 (BR) ORB, 26 April 1944, March 1944, Appendix B, "Service Training Report," 1.

¹²¹ *ibid.*, 27-30 April 1944.

¹²² *ibid.*, Summary for April 1944.

engine change, and the supplies arrived just in time. The squadron's maintenance section had also completed its first DR compass installation, which was successfully tested on the 1st. The installation was described as "very successful and it is hoped that accuracy of navigation will be of a very high order using this compass. Every effort is being made to install the remainder but without a special party this work will drag on slowly."¹²³ Canso "A" 9768 had accumulated enough time to require a major inspection, and it was to become the first of the squadron's aircraft to return to Canada for servicing. Plans were made to fly 9768 back to Canada in company with 164's Dakota, with the Canso's crew picking up a new aircraft and returning to Iceland. Another crew due for leave was flown back to Canada in the Canso, in order to avoid sending an aircraft to the UK and to have a crew ready in Canada to fly serviceable aircraft from Canada to Reykjavik. Plans were apparently underway to bring in such aircraft every two weeks, presumably to avoid diminishing the squadron's strength by servicing delays.¹²⁴

Poor weather in Greenland and a fuel leak in Canso "A" 9768 kept it and the Dakota in Reykjavik on 2 and 3 May, but did not interfere with operations and training. On the 3rd the squadron was notified that the Canso would be taken to No. 4 Repair Depot (RD) in Scoudouc, New Brunswick, instead of Gander as had previously been arranged. The same day, the squadron sent its third crew, commanded by F/L Hornell, on the anti-U-boat course at Maydown. The ORB noted that "our personnel derive considerable benefit from the exercise as well as the exchanging of ideas."¹²⁵ The regular weekly inspection took place on the 5th, and found the huts in very good condition and the grounds very neat, although garbage pickup by the station needed to be more frequent and careful. The squadron hangar and maintenance facilities were also in good condition, and the squadron personnel remaining in hospital following the crash of Canso "A" 9809 on 6 April were

¹²³ *ibid.*, 1 May 1944.

¹²⁴ *ibid.*

¹²⁵ *ibid.*, 2-3 May 1944; EAC Movement Order # 25, 14 December 1943, DHist 181.009 (D274).

improving, although none had yet been released.¹²⁶ The squadron's need for transport was again underlined by the difficulties encountered by the OC and others when touring the squadron's accommodations and facilities. A signal to Eastern Air Command outlining the inadequacy of the squadron's ground transport and requesting its provision had been prepared by W/C Chapman on 4 May, but the Station CO advised against sending it, so no action was taken.¹²⁷

On 7 May, despite snow, hail, rain squalls, and strong winds that washed out local flying, Canso "A" 9768 and Dakota 660 of 164 Squadron took off for Greenland. The Canso carried two crews, as mentioned above, and the Dakota carried three squadron members who had been posted, one on compassionate leave, and a squadron officer to a conference at EAC on radar for the squadron. Three aircraft were also out on operations despite conditions at Reykjavik. The squadron was again called upon for ASR work the following day, when Canso "A" 9765 was out for almost seven hours on an unsuccessful searching for a deHavilland Mosquito of Ferry Command lost the previous night en route from Bluie West 1 to Reykjavik.¹²⁸ On 9 May, the AOC Iceland expressed appreciation for the squadron's high serviceability rate, as well as that of 86 Squadron RAF. The pleasure of the accolade was considerably diminished, however, by the SASO, who had just returned from a conference at Coastal Command Headquarters. The Air Ministry had decided not to supply 162 (BR) with new equipment or re-equip the squadron in any way. A policy of not providing equipment to Dominion forces as well as the previously discussed shortage of equipment led to the decision. The AOC Iceland suggested that W/C Chapman visit Eastern Air Command Headquarters and discuss the situation with Canadian

¹²⁶ *ibid.*, 4-5 May 1944. The RAF had a contractor who emptied latrines and who picked up the garbage on the station, including the squadron's area. "No. 162 Squadron (RCAF) - Miscellaneous Costs of Squadron at Iceland," 1 February 1945, Appendix C, 3, DHist 181.009 (D3410).

¹²⁷ 162 (BR) ORB, 6 May 1944.

¹²⁸ *ibid.*, 7-8 May 1944; Carl A. Christie and Fred Hatch, Ocean Bridge: The History of RAF Ferry Command, (Toronto: University of Toronto Press, 1995), 323. The crew of Mosquito KB220 was F/L G.H. Wood, RAF, pilot, and F/O J.O. Klippel, RAAF, RO/Nav.

authorities. A letter prepared by the SASO outlining British policy was to be passed on to EAC as part of this plan. The use of the squadron on night patrols was again discussed, and the AOC “stressed possible heavy demands on both Sqdns. [on] this base in near future and especially if and when the invasion commences.”¹²⁹

Following the bad news from Coastal Command, good news was received from American forces in Iceland on the 10th, when the squadron was notified that the Americans were willing to supply many tools that the squadron had needed since its arrival in Iceland. Morale was helped out by a squadron smoker, held the same evening. The squadron ORB noted that

the whole evening was injected with a party feeling by the presence of Stags Head Ale and quantities of cheese (very old), crackers and pickles (also very old). . . . Everyone took a very audible interest in the festivity, so much so that S/L Sully even with the aid of a microphone, could not make himself heard. There were a minimum of arguments and friendly scuffles and no one became injured.¹³⁰

This was the first smoker held since the squadron had left Yarmouth in September of 1943, and the ORB described it as “highly beneficial, in that it allowed all personnel to let off steam and vent their views on a great many subjects.”¹³¹ On 11 May, the squadron received a new crew and a new aircraft. F/L Ledbetter and crew flew in from Greenland on the 11th in Canso “A” 9816. They had had a quick trip up from Dartmouth, leaving on 9 May. S/L Murray, the Equipment Officer from EAC HQ, arrived on the flight in order to clear up the squadron’s equipment problems. News was also received from Scoudouc that Canso “A” 9777 was ready to leave for Iceland as a replacement for 9768 which was receiving a major inspection. Preparations were also being made for W/C Chapman to visit EAC Headquarters and discuss the squadron’s equipment situation.¹³²

A change in flying policy was outlined to aircrew officers by W/C Chapman on 12 May. Due to the administrative burdens of setting up the squadron in Iceland, the OC and

¹²⁹ *ibid.*, 9 May 1944.

¹³⁰ *ibid.*, 10 May 1944.

¹³¹ *ibid.*

¹³² *ibid.*, 11 May 1944.

the Flight Commanders had been forced to spend almost all their time on the ground since January. Chapman made it clear that "Flt/Cmdrs and O.C. will fly as and when and in any weather that any other member is allowed to fly." Aircrew were urged to "take more interest in their aircraft and in the ground personnel who maintain them. The general tone of a great many aircrew," Chapman said, "has been what am I getting out of this and very little consideration for the ground personnel."¹³³ That morning, Chapman had sat in on the briefing and preparation for one of the squadron's crews, and inspected the aircraft and equipment. Plans were made for the OC to take at least one crew per week on patrols in order to carry out these checks.

The following day, EAC advised Chapman that he was not to proceed to headquarters in Halifax, since Air Commodore (A/C) Morfee was due to visit Reykjavik on 23 May. Two more of the squadron's Cansos, 9770 and 9841, were ready to go to Scoudouc for servicing when weather permitted. The two crews flying them were to take their two weeks' leave and then return to Scoudouc and ferry aircraft back to Iceland. The supply of equipment to the squadron was discussed in various meetings by S/L Murray, EAC HQ Equipment Officer, on the 14th and 15th. During the latter meeting it was agreed that immediate action was to be taken to obtain tools made available by the Americans. The issue of transportation was also raised, and it was thought that the Americans might also make some Jeeps available to the squadron. The YMCA delivered a considerable amount of equipment to the squadron on the 15th, including chairs to replace the benches used in the theatre. The squadron had earlier received musical instruments from the RAF in order to form their own orchestra for dances and other events. On 16 May, arrangements were made to take care of the supply situation. Squadron personnel were flown to Meeks Field to pick up small tools from the Americans, and S/L Murray and W/C Chapman visited the Station Commander to discuss general equipment issues. The RAF had obtained a

¹³³ *ibid.*, 12 May 1944.

motorcycle for Chapman, which solved the problem of motor transport while avoiding the unnecessary use of a vehicle and driver. A space on an RAF safety course was also obtained for the squadron's safety equipment officer, F/O Buchanan. The evening witnessed some excitement as the air raid sirens sounded in response to what appeared to be an incoming group of thirteen enemy aircraft, although no attack appears to have been made and the ORB makes no further reference to the incident.¹³⁴

Cansos 9770 and 9841 left on a direct flight to Goose Bay on 17 May, carrying WO2 Somerville and Sgt. Dumbell, two of the survivors of the crash on 6 April. Squadron Leader Murray, his assignment in Reykjavik finished, also returned to Canada on one of the aircraft. That evening, a new Canso arrived for the squadron. F/O Leech, who had taken 9768 back to Canada, brought Canso "A" 9777 in directly from Goose Bay. A muster parade was held in the evening, and an epidiascope was used to project photographs taken by the squadron since its arrival in Iceland. Messages announcing the award of the DFC to F/O Cooke were also projected during the show. Preparations were under way to send the squadron's fourth crew on the anti-U-boat course at Maydown, and on the 19th F/O Oakford and crew left for the course, carrying two USN personnel to the same destination.¹³⁵

Although some equipment and supply problems had been resolved by S/L Murray's visit, the squadron still lacked basic equipment. Perhaps the most obvious was an air compressor, which had still not arrived from Canada. Its absence left the squadron dependent on the British and Americans for this essential piece of equipment. Paint thinner was also required in order to clean up the squadron's aircraft, and a shortage of cable connectors was holding up the installation of DR compasses, although efforts by W/C Chapman led to enough connectors being found to complete an installation in one more aircraft. The squadron also received an answer to a query from EAC on the 19th. On 15

¹³⁴ *ibid.*, 9, 13-16 May 1944.

¹³⁵ *ibid.*, 17-19 May 1944.

May, the OC had asked for a ruling on the matter of compassionate leave for squadron personnel. EAC had decided that none would be allowed. During another of the squadron's softball games on the 19th, one of the officers injured his elbow, and the ORB, apparently more used to describing the ailments of aircraft than those of people, noted that "he has since been admitted to hospital and will be U/S [unserviceable] for approx. one month."¹³⁶

By the middle of May the problem of operational exhaustion, which had been mentioned in the squadron's service training report for March, was beginning to cause problems. Two aircrew were complaining of physical pain and mental weariness and had been temporarily grounded. One had logged 866 flying hours, 529 of which were operational, by March, while the other had logged 1194 hours, 874 of which were operational, by that time. In both cases the squadron ORB seems doubtful of their complaints, and notes that the squadron could not spare aircrew from operations, although replacements had been requested.¹³⁷ There were also signs that the squadron's disciplinary problems were not at an end; on the night of 20/21 May, a Leading Aircraftsman fired three shots through the roof of his hut with his service rifle. The case was passed to the Station CO, with the squadron's OC recommending sixty days in Naval detention barracks. The ORB described it as "just foolishness, but cannot treat such matters lightly."¹³⁸ The squadron's third crew to take the anti-U-boat course returned on 21 May. Preparations were underway at this time for the visit of A/V/M Sully and others from Eastern Air Command. Their visit, it was hoped, would help straighten out problems with personnel

¹³⁶ *ibid.*, 19 May 1944.

¹³⁷ *ibid.*, 20 May 1944. There does not appear to be a useful discussion of operational exhaustion and operational tours for Bomber Reconnaissance squadrons or the Canadian squadrons serving with Coastal Command in either Volume II or Volume III of the official history. Terraine, in The Right of the Line, gives the tour of operations for flying boat squadrons in Coastal Command at 800 hours. John Terraine, The Right of the Line: The Royal Air Force in the European War, 1939-1945, (London: Hodder and Stoughton, 1985), 527. Chapter 64 of this book (p. 520-537) provides a discussion of the subject that includes Coastal Command.

¹³⁸ 162 (BR) ORB, 21-22 May 1944.

replacements and tours of duty, the supply of equipment, and other issues that had to be resolved within the RCAF.¹³⁹

In the second part of May the Northern Transit Area, in which aircraft had failed to make any sightings between January and April of 1944, became more active. Actions by both German and Allied forces were responsible for this change. Dönitz had decided to further reinforce the Arctic U-boat flotilla in Narvik for operations against convoys to the Soviet Union and replace its older boats with those from Group *Mitte* in southern Norway. Since the ice in the Baltic had thawed and more U-boats were able to leave Kiel in Germany, the new arrivals that topped up Group *Mitte* allowed the subsequent reinforcement of the Arctic flotilla and the dispatch of U-boats to the Atlantic. British carrier operations off the Norwegian coast led Dönitz to order U-boats travelling to Narvik to perform operational patrols while en route to their new base. Previously, submarines had used the Inner Leads, which lay between the Norwegian mainland and offshore islands, as a transit route to Narvik, since they provided protection against attack. At almost the same time, Coastal Command decided to shift its patrols in the Northern Transit area further to the east and closer to the Norwegian coast in order to cover areas more probably used by U-boats on passage to and from Narvik. Finally, and perhaps most importantly, by the middle of May there was almost continuous daylight in the Northern Transit Area's high latitudes. In previous months the U-boats had depended on darkness to recharge their batteries and allow surface movements when necessary, but the oncoming northern summer robbed them of this cover. The submarines were now forced to charge their batteries on the surface almost entirely in daylight, making themselves vulnerable to detection and attack from the air, since only four of the outgoing boats were equipped with a recent innovation, the schnorkel.¹⁴⁰

¹³⁹ *ibid.*

¹⁴⁰ Air Ministry, "The RAF in Maritime War," IV, 483-484. Although the literal transcription was *schnorchel*, it has usually been spelt *schnorkel* in postwar literature, and this thesis will conform to the generally accepted usage.

The schnorkel was a breathing tube that allowed submarines to operate their Diesel engines while submerged. While it had been proposed before the war, and two Dutch submarines fitted with early examples of the equipment had been captured in 1940, the reliance by U-boats on surface tactics and the inadequacy of Allied air patrols meant that it was ignored by BdU until late in the spring of 1943. Increasingly heavy U-boat losses to aircraft attack led to the revival of the idea, and by the end of 1943 a usable design had been developed and fitted to several U-boats based in France. Others were fitted with schnorkel in German yards, and by February 1944 some U-boats working up in the Baltic were being trained in its use. By the end of May, about thirty operational boats were fitted with schnorkel. Essentially, it consisted of an air induction tube to supply air to the diesels and an exhaust pipe to vent the exhaust. The early installations were about twenty-six feet long and were raised and lowered from a well in the deck by hydraulic power. A float valve at the top of the induction tube prevented the Diesel engine from ingesting water should the head of the Schnorkel dip below the water or be engulfed by a wave. The schnorkel allowed a U-boat to charge its batteries using its Diesel engines while submerged, and also allowed it to proceed on Diesel power while submerged, freeing the submarine from the need to use batteries for sub-surface travel. The air on board a U-boat could also be renewed without its having to surface and ventilate. While the U-boat could not travel as quickly while schnorkelling with Diesel power as it could while using its Diesels on the surface, the schnorkel allowed long operations while submerged, and meant that the U-boat no longer had to surface. This was the main advantage of the device, since it greatly reduced the chances of detection, either visually or by radar.¹⁴¹

In May, however, few operational U-boats were fitted with schnorkel. As the length of nights decreased in the high northern latitudes Coastal Command's inability to perform substantial nighttime patrols in the Northern Transit Area therefore became less of

¹⁴¹ Air Ministry, "The RAF in Maritime War," IV, 240-241; Rössler, The U-boat, 198-204.

a liability, and sightings began on 16 May, when Sunderland V/330 Squadron (Norwegian) mortally damaged *U-240* despite intense flak that killed the flying boat's front gunner and wounded two other crew members. In the following six days, five U-boats were sighted by flying boats from 18 Group. Five attacks were made on four of the submarines, sinking *U-241*, damaging *U-668* and forcing its return to port, and inflicting casualties on *U-995* from aircraft machine gun fire that forced it to put in to Trondheim. On 24-25 May a series of attacks was carried out as a result of six sightings of five U-boats. Six attacks were made, which sank *U-476*, *U-675*, and *U-990*, and forced *U-921* to return to base due to casualties inflicted by machine gun fire. In return, Sunderland R/422 Squadron (RCAF) was lost, probably shot down by *U-921*. At this point, Coastal Command realized that it had found a point at which the U-boats were vulnerable, and began to plan as many sorties as possible into the area between the Norwegian coast and as far out as 7 or 8° West, the longitude of the Faeroe Islands (See Map 4).¹⁴²

Aircraft from 162 (BR) had already become involved in the actions off Norway. One of the four aircraft on patrol on 22 May, flown by F/O Hildebrand and crew, landed at Wick, Scotland, after providing escort for convoy RU 120. The following day, a request was received from Coastal Command's No. 18 Group that F/O Hildebrand and crew be retained at Wick in order to take part in "some very productive U/B hunting."¹⁴³ On 24 May, Coastal Command Headquarters sent the following message to RAF Iceland:

Concentration of U Boats between 62N and 65N east of 2E has provided 18 Group with profitable hunting for past few days request you provide all assistance possible to continue the good work. You should consider possibility of operating Cansos from Wick. 18 Group will co-ordinate operations.¹⁴⁴

¹⁴² Air Ministry, "The RAF in Maritime War," IV, 484-486; Greenhouse *et. al.*, The Crucible of War, 408-409. Peyton-Ward attributes the loss of R/422 to *U-476*, but Volume III of the RCAF official history concludes that this could not have happened. The Sunderland was probably lost to *U-921*, which may have misidentified it as a Catalina, which led to subsequent confusion.

¹⁴³ 162 (BR) ORB, 21-23 May 1944; "162 (RCAF) Squadron Operations with 18 Group from Wick," unpublished narrative [1945], 3, DHist 74/1.

¹⁴⁴ HQCC to RAF Iceland, signal AC.516, 24 May 1944, PRO AIR 15/287.

This request for Cansos could only mean 162 (BR). W/C Chapman and F/L Hodgson were summoned to ACHQ within an hour of the message's transmission. In consultation with the SASO, it was decided that three additional aircraft could be sent on temporary duty to Wick. Each was to have enough flying time left before the next minor inspection was scheduled to carry out the flight in both directions as well as two fourteen hour patrols from Wick.¹⁴⁵ In addition to their crews, each Canso carried four maintenance personnel to form a skeleton groundcrew. The first of the Cansos to leave for Wick was 9755, with S/L Poag and crew. Cansos 9842 and 9808, with F/O Lawless and crew and F/O Sherman and crew respectively, left early on the 25th, arriving in Wick shortly after noon. By 25 May there were four of 162's aircraft in Wick, and a pattern of armed transit reconnaissance patrols, which had begun with the three aircraft mentioned above, started a few days later.¹⁴⁶

In the meantime, A/V/M Sully, accompanied by engineering, medical, and personnel officers, arrived in Reykjavik from Canada on 25 May. Weather had prevented local flying, and the Liberator carrying the visitors had to land at Meeks Field just before midnight. The following day Sully and his party toured the squadron's installations, and later held a meeting with W/C Chapman to discuss the squadron's problems in Iceland. First on the list was new aircraft, either B-29s, B-24s, or Fortresses (B-17s), followed by

¹⁴⁵ 162 (BR) ORB, 24 May 1944. The scheduled fourteen hour patrols indicate that none of them were to carry the Mark 24 Mine, and that the aircraft were armed with four 250-lb. depth charges.

¹⁴⁶ *ibid.*, 24 May 1944; "162 (RCAF) Squadron Operations with 18 Group from Wick," 3. The records for these moves are unclear and contradictory. According to the diary entry in the ORB, Poag left at 1200 hours and arrived in Wick at 0942, while according to the Air Historian's narrative, Poag left at 0216 on the 24th, stopped at Meeks Field to top up his fuel, and arrived at 1142. This suggests that the message from 18 Group was sent before Coastal Command Headquarters', since either version means that 9755 left before the latter message was sent. Cansos 9842 and 9808, with F/O Lawless and crew and F/O Sherman and crew respectively, left early on the 25th, arriving in Wick shortly after noon. Again, the ORB and the Air Historian's narrative do not agree. The time differential between Reykjavik and Wick, and the narrative's use of the 18 Group ORB either in addition to or instead of the 162 (BR)'s ORB probably accounts for the difference. The problem is compounded by the absence of takeoff and landing times in the squadron flying record in the ORB.

new equipment: ASG (10-cm) radar, sonobuoys, radio altimeters, and tools and spare parts. Problems with motor transport, the purchase of jeeps and a cletrac (tracked tractor) from the Americans, and having squadron aircraft returning from Canada carry needed spare parts and rations, canteen supplies, beer, liquor, and fruit juices were also discussed. A weekly flight from Canada carrying mail, aircraft parts, and extra rations was suggested, and personnel issues, including an increase in certain establishments and in aircrew replacements were raised. The addition of a laundry, tailor shop, cobbler's shop, and powdered milk plant along with the corresponding personnel were also among the additions and improvements suggested. Discussions continued on the 27th, and the ORB recorded that "a great many of our difficulties were ironed out."¹⁴⁷

Although many of the squadron's difficulties in Iceland had apparently been remedied by the end of May, it had taken almost five months to do so. Supply problems and shortages of essential maintenance equipment had quickly become apparent, but had not been quickly dealt with. Due to a series of technical and supply problems and inadequate preparation by Eastern Air Command, the radar and electronic equipment of the squadron's Cansos was not up to the standard of Coastal Command aircraft, and the inadequacies could not be quickly resolved by either the British or the Canadians. Many of the problems encountered by the squadron would not be solved for some months to come, while solutions for others would take even longer. Despite these disadvantages, 162 (BR) had already made two attacks on U-boats by May 1944. Even in the face of wartime uncertainty, one of the submarines had almost definitely been destroyed. So far, the

¹⁴⁷ *ibid.*, 25-27 May 1944. The use of B-29s for maritime patrol seems to be more wishful thinking than anything else, but the re-equipping of 162 (BR) with B-24s was suggested in June 1944. Douglas, The Creation of a National Air Force, 602. Interestingly, in late 1952 discussions surrounding maritime patrol aircraft to replace the Lancaster 10 (MR) suggested the B-29 and its successor, the B-50, as replacements. Michael J. Neufeld, Search the Sea: An Illustrated Short History of the Long Range Patrol Aircraft in the Canadian Armed Forces, (n.p., August 1974), 45. ASG could not be mounted in Cansos due to weight restrictions. Sarty, "The RCAF's Eastern Air Command, ASV Radar, and Submarine Hunting," 13. For correspondence concerning the squadron's supply problems and EAC's attempts to rectify them, see DHist 181.003 (D4864).

squadron had a established a respectable record, both against U-boats and in operational hours flown. This was to change quickly. Beginning in late May, 162 (BR) began an operational commitment in Wick that was to place many of its aircraft in the Northern Transit Area at a time of heavy U-boat traffic and almost continuous daylight. The squadron's aircrew were to prove their worth against U-boats during June of 1944, but shortcomings with its aircraft would have tragic repercussions.

Chapter 6

Guarding the Back Door to Overlord: May-June 1944

Invading Europe was bound to be a bloody business, but few realized that the far Northern phase of the invasion operations was in its way as hard as the assault on the Norman beaches One Canadian squadron - a unit smaller than a company of infantry - sank four U-boats and lost three Catalinas in June alone.

Joint Admiralty-Coastal Command communiqué, July 1944.¹

June of 1944 was a bloody month indeed. The Allied landings in Normandy on 6 June, codenamed "Overlord", drastically changed the pattern of the Second World War. The Allied beachhead and the naval and air operations directly supporting it garnered much of the attention at the time and in the years that followed, while supporting operations farther afield were often ignored. These more distant operations, however, also played an important part in guaranteeing the success of the invasion. Among the many actions taken to safeguard the landings were those of Coastal Command's 18 Group in the waters north of the British Isles. This group patrolled the Northern Transit Area, through which U-boats operating from German and Norwegian bases had to pass. Although the primary submarine threat to the landings was from the major naval bases in France, close to the invasion beaches, boats from Germany and Norway could also threaten the landings, as well as make attempts to attack Allied shipping in other areas. Operations by 18 Group to counter these possibilities were carefully planned and implemented over a period of months, and by mid-May were already taking their toll on German submarines. It was in these operations north of Britain that 162 (BR) earned its lasting fame.

By the time 162 (BR) shifted its operations to the Northern Transit Area in May it had achieved no particular distinction. Its life as one of the odd-job squadrons of Eastern Air Command had been marked by almost two years of fruitless patrols, unserviceable aircraft, training, hangar cleaning, and ferrying of aircraft until it was posted to Iceland in

¹ Quoted in Sholto Douglas, Years of Command: The Second Volume of the Autobiography of Sholto Douglas, (London: Collins, 1966), 271.

January 1944. By that time, the squadron had recorded only one inconclusive attack on a submarine. Since its arrival on the island, two U-boats had been attacked, the second with very promising results. Even so, little seemed to distinguish it from other squadrons, with the exception of the daily problems of living in and operating from Iceland while still depending on Canada as a source of supply and base for maintenance, as well as its status as the worst-equipped squadron in Coastal Command with respect to radar.² Despite these problems, however, during the month of June 1944 162 (BR) would distinguish itself in actions against U-boats in the Northern Transit Area.

In the latter part of May 1944, the Northern Transit Area became a profitable hunting ground for aircraft of Coastal Command's 18 Group. Between 16 and 25 May five U-boats were sunk, one damaged, and two forced to return to base due to casualties. Despite vigorous efforts to defend themselves, the submarines only succeeded in severely damaging one aircraft and shooting down another. In order to take advantage of the concentration of U-boats now off the coast of Norway, Coastal Command Headquarters suggested on 24 May that RAF Iceland provide assistance to 18 Group, and that as part of this, the Cansos of 162 (BR) could operate from Wick, Scotland. The shift came quickly. By 25 May four Cansos were in Wick, and transit patrols between there and Reykjavik, as well as patrols based entirely at Wick, began shortly thereafter. Aircraft from 15 Group joined those from Iceland in reinforcing 18 Group in order to exploit the concentration of U-boats in the Northern Transit Area.³

Many of the U-boats attacked between 16 and 25 May had been performing sweeps off the Norwegian coast while on their way to the Arctic Flotilla in Narvik. By the 25th,

² In March 1944 Coastal Command considered 162 to be "virtually without radar." 162 (BR) ORB, March 1944, Appendix D, OC 162 (BR) to AOCinC, EAC, "Radar Improvement for Number 162 Squadron Reykjavik Iceland," 30 March 1944.

³ Great Britain, Air Ministry, Air Historical Branch, "The RAF in Maritime War, IV: The Atlantic and Home Waters, the Offensive Phase, February 1943 to May 1944," 484-486, DHist 79/599; HQCC to RAF Iceland, signal AC.516, 24 May 1944, PRO AIR 15/287. Iceland was a distinct Coastal Command group with its own headquarters, under the control of Coastal Command Headquarters.

the Captain of U-boats, Norway, realized that as a result of increased air activity two submarines had definitely been destroyed and others damaged. The decision that U-boats en route to Narvik should carry out these offshore patrols was rescinded on 25 May, and sailing under close surface escort in the Inner leads was resumed. U-boats bound for the Atlantic, however, still had to pass through the Northern Transit Area, including any submarines sent to attack the anticipated Allied invasion of France, and were therefore vulnerable to air attack. The patrols flown by aircraft from Wick seem to have been mainly Creeping Line Ahead (CLA) sweeps over clearly demarcated areas. Available flying records place most of these patrols in an area lying roughly between 62° to 65° North and 7° West to 6° East, an area that lies astride the route from Trondheim and other bases to the Atlantic. These patrol locations lie within those established by 18 Group at the end of May. The entire area from 59° to 66° North and 10° West to 10° East was divided into 115 rectangular patrol areas. Each was identified by letters or numbers, and the patrol areas could be shifted by adding a colour to the designation that signified a movement of thirty miles to the north or east.⁴

The first patrol by one of 162 (BR)'s Cansos in this area was actually carried out on 23 May, when 9810 flew a sixteen and-a-half hour patrol. By 25 May, 9810 had been joined by three other Cansos, 9755, 9842, and 9808. Another patrol was carried out by 9810 on this date, when three Norwegian fishing boats were sighted and momentarily mistaken for submarines. A Sunderland, almost certainly from 330 (Norge) Squadron, was sighted during the return from patrol.⁵ All four of the Cansos at Wick were on patrol on 26 May, and two carried out patrols through the night, landing on the 27th. The

⁴162 (BR) ORB, 23-25 May 1944; "162 (RCAF) Squadron Operations with 18 Group from Wick," unpublished narrative [1945], 3, 9, DHist 74/1. The squadron ORB also gives locations, but unfortunately they are encrypted. Great Britain, Air Ministry, Air Historical Branch, "The RAF in Maritime War, V: The Atlantic and Home Waters, the Victorious Phase, June 1944-May 1945," 16, DHist 79/599. The colours used were red, blue, green, or yellow. Some of the patrol area designations that resulted and that were flown by the squadron were "Area Blue Peter West" and "Area Green Oboe". "162 (RCAF) Squadron Operations with 18 Group from Wick," 10, 15.

⁵ Air Ministry, "The RAF in Maritime War," IV, 484, 486; 162 (BR) ORB, 23-25 May 1944.

virtually continuous daylight at northern latitudes made these patrols possible, even for aircraft like 162's that were not equipped for night patrols.⁶

In the meantime, attacks and sightings were diminishing from the intense activity of 24-25 May. On 26 May, *U-958* was attacked by two Mosquitoes from 333 Squadron using cannon fire. The resultant damage to fuel tanks and casualties amongst the crew forced the boat to put back to Bergen. The following day, *U-292*, heading for the Atlantic, was attacked and sunk by Liberator S/59. Although five more sightings were made during the following four days, only one attack, which failed to damage the U-boat, resulted. One of the submarines, *U-862*, returned to Bergen due to the heavy air patrols, however, and eventually entered the Atlantic through the Denmark Strait. The air patrols also led Dönitz to order five outward bound U-boats southeast of Iceland on 1 June to make for ports on the French coasts in order to receive schnorkel installations, "as it seems no longer possible to keep boats in operational area unless equipped with this apparatus."⁷ The value of the

⁶ "162 (RCAF) Squadron Operations with 18 Group from Wick," 9, 11, 12. Darkness on 27 May, for instance, lasted only from 0101 hours to 0248 hours. *ibid.*, 11. See Chapter 5 for a discussion of the unsuitability of 162's Cansos for night patrols. It should be noted that there is a two hour time difference between Wick and Reykjavik. Also, the narrative of operations from Wick and the squadron ORB do not always agree about aircraft movements. Furthermore, the times for takeoff and landing for flights originating in Wick are often not given in the flying record in the ORB, although they are usually given in the narrative of operations from Wick.

No operational flying had been carried out from Reykjavik between 23 and 27 May by 162 (BR), but thereafter operational flights resumed in addition to the regular training and test flights, although at a reduced level. Aircraft that were due for major inspections continued to be ferried to Scoudouc. The policy of sending the squadron's aircraft to Canada for major inspections and servicing, which had begun only shortly before, was already improving serviceability. In April, a daily average of six of fourteen aircraft had been serviceable, while in May the average increased to nine of thirteen, an improvement that the squadron's ORB attributed largely to this change in maintenance policy, which allowed the maintenance personnel to concentrate on minor checks and inspections that could be completed quickly and return an aircraft to service, instead of carrying out time-consuming major inspections and overhauls. 162 (BR) ORB, 23 May - 2 June; "162 (RCAF) Squadron Operations with 18 Group from Wick," 3, 4, 17; 162 (BR) ORB, May 1944, Appendix B, "Squadron Maintenance Report, April - May 1944".

⁷ Air Ministry, "The RAF in Maritime War," IV, 486. The roundabout journey of *U-862* was allowed by Dönitz because of its slow diving time. It was a Type IXD₂, which displaced some 1,616 tons when surfaced, and was on its way to the Indian Ocean. Eberhard Rössler, The U-boat: The evolution and technical history of German submarines, (London: Arms and Armour Press, 1981), 337. BdU war diary, 2 June 1944, IX, 315, DHist 79/446, Air Ministry, "The RAF in Maritime War," IV, 486.

schnorkel “apparatus” as a counter to Allied air patrols was demonstrated by five U-boats so equipped that passed through the Northern Transit Area and the Iceland - Faeroes channel in late May without being detected.⁸

Some indication of the extent of patrols by Coastal Command in the Northern Transit Area and of the co-ordination of patrol areas can be gained from flights carried out by 162's Cansos on 27 and 29 May. On the 27th, two of the three Cansos on patrol had been fed through Area “Tare”, covering the area five and one half times without spotting anything of interest, while the third was assigned a neighbouring area. All three were on overnight patrols, landing on the 28th. On 29 May, the patrol area assigned to Canso 9767 was shifted to the west by a message from base while the aircraft was on patrol, indicating a centralized control of the patrol areas. While 9767 made it back to Wick at the end of its patrol, low cloud, drizzle, and sea-fog at Wick came close to diverting the other Canso, 9816 to Stornoway. The weather was not always unfavourable, however, since on 9816's next patrol, on 31 May in Area Blue Mike, visibility was unlimited and the Norwegian coast was clearly visible on the horizon.⁹ Coastal Command's aircraft were not the only Allied forces operating in the Northern Transit Area. On 1 June, Canso 9767 was searching Area Blue Mike, and sighted two cruisers, eight destroyers, and “numerous aircraft”. This was almost certainly part of the Royal Navy carrier force that had been sent to attack the *Tirpitz*. A sighting by German reconnaissance aircraft, however, had put an end to the mission, and the force was used to attack convoys off the Norwegian coast. On 1 June, an attack on a convoy north of Stadlandet (see Map 4), which sank two ships, was underway. There was some temporary excitement later in the Canso's patrol when a dead whale was mistaken for a submarine. This was another overnight patrol, and early

⁸ Air Ministry, “The RAF in Maritime War,” IV, 486. They were *U-988*, *U-767*, *U-719*, *U-1191*, and *U-671*. *ibid.*, V, 17, n.1.

⁹ “162 (RCAF) Squadron Operations with 18 Group from Wick,” 14, 17.

morning conditions at Wick led to the Canso's diversion to Sumburgh.¹⁰ The transfer of aircraft between Wick and Reykjavik had temporarily reduced the number of operational sorties flown from both bases; on 1 June there had been only one operational flight from Wick and a transit flight from Ballykelly to Reykjavik by Canso "A" 9755. Twice as many aircraft were flying patrols and transit reconnaissance missions the following day, and one of the patrols brought results.¹¹

A group of U-boats, two of which were fitted with schnorkel, were travelling north between Norway and the Shetland Islands. Three sightings had been made by 18 Group aircraft, but the only attack resulting from them was spoiled by malfunctioning depth charge release gear that resulted in a miss astern.¹² A fourth sighting was made at 0211 hours on 3 June by Canso "A" 9816 of 162 (BR). Flying due south at 1,700 feet, the pilot, F/L R.E. MacBride, sighted a U-boat forty-five degrees to port.¹³ The submarine, on a reciprocal course, was forging ahead at fifteen knots in a calm sea. MacBride turned to port and dove towards the U-boat. The Canso's forward guns opened fire at 1,000 yards, scoring hits on the conning tower. In the meantime the U-boat had turned 135° to starboard, opening an "intense" fire on the Canso. Tracer fire was seen to pass under its wings, but undulating evasive action helped avoid any damage from the flak. The aircraft continued to dive on the U-boat, and made an attack along the boat's track from stern to bow at over 170 miles per hour, sixty feet off the water. Four Mark XI Torpex depth

¹⁰ *ibid.*, 17; S.W. Roskill, The War at Sea, 1939-1945: Volume III: The Offensive, Part I: 1st June 1943-31st May 1944, (London: HMSO, 1960), 281. The unsuccessful attack was known as Operation "Tiger Claw". David Brown, Tirpitz: the floating fortress, (London: Arms and Armour Press, 1977), 36.

¹¹ 162 (BR) ORB 1-2 June 1944, "162 (RCAF) Squadron Operations with 18 Group from Wick," 4, 14, 17.

¹² Air Ministry, "The RAF in Maritime War," IV, 486-487.

¹³ The crew consisted of F/L R.E. MacBride, pilot, F/O J.K. Guttormson, 2nd pilot, F/O W.C. Lawrence, navigator, Sgt. C.G. White, engineer, Sgt. T.C. Harper, 2nd engineer, W/O D.J. McDonald, WOP/AG, P/O G.P. McNulty, WOP/AG, and F/S G.W. King, WOP/AG. 162 (BR) ORB, July, 1944, Form UBAT; Norman L.R. Franks, Search Find and Kill: Coastal Command's U-boat Successes, (Bourne End: Aston Publications, 1990), 46.

charges fell into the water with a spacing of about ninety feet, bracketing the submarine. The first depth charge undershot to port, the second undershot slightly to starboard, the third exploded amidships on the port side, and the fourth detonated within ten feet of the starboard bow.¹⁴ Leaving its target squarely in the middle of the depth charge plumes, the Canso flew on for some fifteen seconds, to let the backward-facing mirror camera record the results. It then turned sharply to port and made a second attack with machine guns. Hits were once again observed around the conning tower, and there was no return fire from the submarine.

MacBride's attack was devastatingly accurate. The U-boat "appeared to lift bodily" from the explosion of the charges, swinging to port and almost coming to a complete stop. Submerging on an even keel, the submarine left a small oil patch on the water and at least five survivors in the water who appeared to be waving at the aircraft. MacBride and his crew circled the site of the attack for 3 3/4 hours, during which time the oil patch grew to a mile in length and 400 yards in width. An oil slick a mile long, beginning where the U-boat submerged and ending in a patch about 100 yards square, was also seen. When the Canso reached its prudent limit of endurance (PLE), course was set for Wick. Unlike the attack that sank *U-342* in April, no aircraft arrived to relieve 9816.¹⁵

The attack was assessed as "U-boat probably sunk", since it had been too dark for the cameras in the aircraft to record the attack and allow a more definitive assessment. Despite the incomplete evidence, Peyton-Ward at Coastal Command described it as "a bold, direct and determined run in under flak followed by an excellent attack. On the visual evidence of the position of explosions this should have been lethal."¹⁶ The attack had in

¹⁴ 162 (BR) ORB, July, 1944, Form UBAT; "U/Boat Attack Assessment Form, Serial No. 1061," 3 June 1944, PRO AIR 15/137.

¹⁵ *ibid.*

¹⁶ "U/Boat Attack Assessment Form, Serial No. 1061," 3 June 1944, 2, PRO AIR 15/137. Since survivors were seen in the water, it may seem unusual that the U-boat was assessed as "probably sunk", but cases apparently existed where some crew members who were topside at the time of an attack were left in the water when the U-boat crash-dived. The presence of

fact been lethal, and had sunk *U-477*. The Type VIIC U-boat, under the command of Oberleutnant Karl Joachim Jensen, was on its first war cruise. Sailing from Kiel on 13 May to join Group Mitte, *U-477* had put in to Norway, and left Kristiansand on 28 May. This submarine was the one that had been sighted three times on the previous day, and, curiously, had been one of the two schnorkel equipped U-boats passing between Norway and the Shetlands. Either the captain of the boat had been impatient because of the slow speed imposed by the schnorkel, or there had been technical difficulties with the relatively new equipment.¹⁷

MacBride's successful attack was the product of training and experience, as well as fortunate circumstance. In February, MacBride and crew had been the first of the squadron's personnel to attend the anti-submarine course at Maydown in Northern Ireland, where they benefited from the experience of Coastal Command crews and the opportunity of making practice attacks against a "tame" submarine. Experience also played an important role; by March of 1944 MacBride had already logged well over 1700 hours' flying, the most in the squadron at the time. The evasive action taken by the *Canso*, and the machine gun fire used against the U-boat's flak gunners also undoubtedly contributed to the success of the attack and the aircraft's survival in the face of anti-aircraft fire. Other factors, beyond the control of the aircrew also played a role. The low light conditions at the time of the sighting probably reduced the effectiveness of the U-boat's lookouts, since the submarine's anti-aircraft gunners opened fire only at very close range. The submarine's presence on the surface was also unusual, since *U-477* was equipped with a schnorkel. Although the true reasons for *U-477*'s proceeding on the surface will never be known, its actions were not unusual. Peyton-Ward notes that "the northern area actions at

survivors in the water did not therefore automatically prove that a submarine had been sunk. Franks, Search Find and Kill, 9.

¹⁷ 162 (BR) ORB, July, 1944, Form UBAT; "U/Boat Attack Assessment Form, Serial No. 1061," 3 June 1944, PRO AIR 15/137; Air Ministry, "The RAF in Maritime War," IV, 486-487; Franks, Search Find and Kill, 46; BdU war diary, 13 May, 28 May 1944, IX, 280, 309.

this time were notable in that . . . all the U-boats whether fitted or not with schnorchel elected to fight it out with flak against the attacking aircraft.”¹⁸ No reason for these actions was found in German records, and he suggests that

it may be that overconfidence among U-boat captains on their first war cruises resulted in this defiance to air attack. On the other hand, there is evidence that the newly fitted schnorchels were giving trouble and some of the surfaced encounters may have been involuntary.¹⁹

Günter Hessler, in his history of the U-boat war, written from the German point of view and without the benefit of Allied documents, reached much the same conclusion:

the waters through which these boats had to pass were heavily patrolled, but the schnorkel should have taken care of that problem. We were therefore forced to assume that, with crews only imperfectly trained, the boats in question had occasionally found it necessary to surface, an assumption supported by comparison of their plotted positions with those contained in intercepted British radio messages.²⁰

Even though *U-477*'s presence on the surface may have been involuntary, experience and training meant that the best advantage was taken of the opportunity.

The sinking of *U-477* on 3 June was virtually the last sighting in the Northern Transit area before D-Day and it was not until 11 June that a new series of sightings and attacks in which 162 (BR) was involved began. During its first fifteen days of activity in the Northern Transit Area, from 22 May until 5 June, 162 (BR)'s operational flying consisted of twenty-two transit reconnaissance missions, almost entirely between Reykjavik and Wick, twenty-two missions from Wick, ten missions from Reykjavik, and four ferry flights between Iceland and Canada.²¹

¹⁸ 162 (BR) ORB, 8 February 1944; "Interview by Roger Sarty with S.E. Matheson" 14 June 1993, 2, DHist Biographical File; 162 (BR) ORB, March 1944, Appendix B, "Service Training Report," 3; Air Ministry, "The RAF in Maritime War," V, 17.

¹⁹ *ibid.*, 17, n. 5.

²⁰ Günter Hessler, The U-Boat War in the Atlantic, 1939-1945, Volume III: June 1943-May 1945, (London: HMSO, 1989), 80.

²¹ Air Ministry, "The RAF in Maritime War," IV, 487 ; 162 (BR) ORB, 22 May - 5 June 1944; "162 (RCAF) Squadron Operations with 18 Group from Wick," *passim*.

In the meantime, other events intervened and soon affected the war in the West, including the campaign against the U-boat. The Allied invasion of Europe began on 6 June 1944, and Allied plans to protect the landing beaches in Normandy and German counter-invasion actions dictated the form of anti-submarine warfare in the weeks that followed. Both sides had been planning and preparing for the invasion, but the Allies had the advantage of setting time and place, while German forces faced the difficult task of defending the entire coastline of occupied Europe while at the same time fighting a defensive war against the Soviet Union in the east.

One of the Allied concerns when planning for the invasion was the threat presented by U-boats to the landing forces and to the crucial reinforcements and supplies that would follow them across the Channel. Co-ordination of naval and air forces would be required in order to prevent German submarines and surface forces from inflicting critical damage on the dense arrays of ships that would surround the invasion beaches. Escort vessels and coastal craft formed part of the naval protection against submarines and surface combatants. Since one of the primary concerns was the threat of submarines, and the planned landings in Normandy were close to the large German bases in Brest and along the Biscay coast, a massive effort was planned to keep U-boats and surface combatants from reaching the invasion area from the south. As part of this blocking force, a total of ten support groups and three escort carriers were allocated to the southwestern approaches to the English Channel, with the carriers protecting the escorts from the threat of air attack.²²

Coastal Command formed an integral part of these operations, and on 18 April Air Chief Marshal Sholto Douglas, AOC-in-C of Coastal Command, issued a directive on the role of the command in Operation Overlord. The result of discussions and meetings between Coastal Command and various naval authorities, the directive included appendices

²² S.W. Roskill, The War at Sea, 1939-1945: Volume III: The Offensive, Part II: 1st June 1944-14th August 1945, (London: HMSO, 1961), 17-20. The ten support groups contained fourteen destroyers, thirty-seven frigates, and three sloops. Air Ministry, "The RAF in Maritime War," V, 1.

outlining the tasks of the various Groups, the planned order of battle, and instructions about patrol areas, and signal procedures and organization. A reallocation of squadrons was an important part of Coastal Command's plans for the invasion. A total of twenty-one anti-submarine squadrons were to be allocated to 19 Group (see Map 5), which covered the southwestern approaches to the English Channel, and patrols were planned that would cover any given point at least once every thirty minutes. Intended to destroy or deter any U-boat attempting to enter the invasion area, they were thereafter called the "Cork" patrols. The AOC 19 Group also had first call on the anti-submarine aircraft from 15 Group, which brought the maximum available strength to twenty-seven squadrons totalling three hundred and ninety-two aircraft. The Strike Wing belonging to 18 Group was moved to 19 Group in April to reinforce anti-shipping forces in the southwest approaches to the Channel, while 16 Group, which was responsible for protecting the immediate eastern flank of the invasion, had seven anti-shipping squadrons under its command.²³

Of the Coastal Command forces in 15 Group and Iceland, the directive assigned 162 (BR) and the three VLR Liberator squadrons to the escorting of threatened convoys, covering the entrances to the North Channel and the Northern Transit Area, and providing aircraft for fleet reconnaissance if necessary. The Sunderland and Catalina squadrons in 18 Group were to join in on the latter two tasks.²⁴ The deployment of a Canso detachment to Wick in late May would have had little effect on these plans, since coverage of the North Channel and the Northern Transit Area could be provided by these aircraft. The aircraft from 15 Group that had reinforced 18 Group in the Northern Transit Area in late May, however, were recalled on 5 June for the Cork patrols in the Channel, but 18 Group and

²³ Roskill, *The War at Sea*, III, pt. 2, 18-20; Air Ministry, "The RAF in Maritime War," IV, 580-581; *ibid.*, V, 1-2.

²⁴ *ibid.*, IV, pt. B, 581-582. The three VLR squadrons were 59 and 120, based at Ballykelly, Northern Ireland, and 86 at Reykjavik. The latter maintained detachments at Tain, Scotland, and at Ballykelly. Number 330 (Norge) Squadron operated Sunderlands, and 210 and a detachment of 333 (Norge) Squadron operated Catalinas. The other flight of 333 operated Mosquitoes in the reconnaissance, escort and strike roles. *ibid.*, V, App.1, "Coastal Command Order of Battle, Strength and Availability, 5 June 1944," 1-3.

Iceland's anti-submarine forces were still left with a total of sixty-two aircraft in six squadrons available for anti-submarine work. On 3 and 5 June, probably as a result of the withdrawal of the reinforcements from 18 Group, the Senior Air Staff Officer in Iceland asked 162 (BR) to send more aircraft to Wick. With these final movements, the anti-submarine preparations for the invasion were ready.²⁵

For their part, German forces were poorly prepared to repel an Allied invasion of Europe. Hitler's "intuitions" about Allied landings in locations as varied as Norway, the Netherlands, Jutland, the Gironde, and even Normandy had interfered with reasonable and reliable intelligence assessments of Allied intentions. By June 1944, the ability to defend Western Europe was more plan than actuality. The Luftwaffe, the Army, and the Kriegsmarine had all made plans, but manpower shortages and the sheer length of coastline to be defended were considerable obstacles to their implementation. The navy's plan realized that naval forces alone could not prevent or repulse a landing, but delaying action could allow the army vital time to counter-attack and defeat an attempted invasion. The navy had only one capital ship, the *Tirpitz*, remaining in full commission in Norway, while the remaining major surface units were in use as training ships in the Baltic.²⁶ In the face of Allied naval power Admiral Dönitz realized that any attempt by large surface units to interfere with the invasion would be futile. On 19 February 1944, the navy's anti-invasion tactics were set forward in an appreciation and policy statement. They consisted of the following:

²⁵ *ibid.*, V, 16, 2; 162 (BR) ORB, 3, 5 June 1944.

²⁶ For a brief outline of the German naval countermeasures to an invasion, see Air Ministry, "The RAF in Maritime War," IV, 586-589. See Roskill, The War at Sea, III, pt. 2, 5-40, for a discussion of the Allied naval and maritime air preparations. The intelligence aspects of invasion planning, including Allied intelligence on German intelligence appreciations, are discussed in F.H. Hinsley, British Intelligence in the Second World War: Its Influence on Strategy and Operations: Volume Three, Part II, (New York: Cambridge University Press, 1988), 3-101. Numerous Allied deceptions also interfered with German attempts at predicting possible invasion sites; among these deceptions were operations by the Royal Navy off the Norwegian coast. Roskill, The War at Sea, III, pt. 1, 279. The remaining German major surface units consisted of two pocket battleships, seven cruisers, and two pre-dreadnought battleships. Air Ministry, "The RAF in Maritime War," IV, 586.

- 1) Attacks on the landing craft by U-boats, light patrol craft and coastal artillery.
- 2) Attacks on enemy shipping in the invasion area with midget submarines, one-man torpedoes and other small battle units.
- 3) Attacks on Allied Atlantic communications with the new prefabricated Type XXI U-boats.
- 4) Protection of the whole western European coastline with the RMK concrete mine.
- 5) Beach obstructions and local batteries at particularly likely landing places.²⁷

Two U-boat groups, *Landwirt* and *Mitte*, were also created in order to respond immediately to an Allied invasion. Group *Landwirt* was based in the Bay of Biscay ports, while Group *Mitte* was based in southern Norway. In early June, Group *Landwirt* had thirty-six U-boats, while Group *Mitte* had twenty-one. There were also thirteen U-boats at sea in the Northern Transit Area at this time, making their way into the Atlantic.²⁸

The Allied landings in Normandy began early on 6 June, and at 0305 hours BdU received a report that parachutists and gliders were landing in western Normandy. At 0310 Flag Officer Submarines West was telephoned and ordered to put Group *Landwirt* on immediate readiness, and the same message was passed to Group *Mitte* at 0343 hours. Shortly thereafter the seven U-boats on passage to the Atlantic that were still to the east of Iceland were ordered to remain in their current areas for the time being. They included *U-477*, which had already been sunk, although BdU did not yet know of its destruction. A short time later the five schnorkel boats that had recently entered the Atlantic via the Iceland-Faeroes passage were ordered to western France at maximum continuous speed,

²⁷ Air Ministry, "The RAF in Maritime War," IV, 588. See V.E. Tarrant, The Last Year of the Kriegsmarine: May 1944-May 1945, (London: Arms and Armour Press, 1994), 34-39 for a description of the various types of "small battle units", and *ibid.*, *passim*, for an account of their operational use. For a number of reasons, the foremost of which were the technical difficulties experienced with a new type of submarine, production bottlenecks, and effects of the Allied bombing and aerial minelaying campaign, the threat to North Atlantic convoys from the Type XXI U-boat did not develop. Interruptions in delivery of the RMK mine, caused by bombing attacks on the rail system, and the destruction of many minelaying vessels meant that even the limited defences of the landing areas were incomplete. Air Ministry, "The RAF in Maritime War," V, 5-6; Rössler, The U-boat, 240-245.

²⁸ Air Ministry, "The RAF in Maritime War," IV, 588; *ibid.*, V, 4-5.

remaining submerged during the day. The intention was that the schnorkel boats in the Atlantic be brought to the landing beaches, while the boats to the east of Iceland were to remain on station until it became clear if landings would be attempted in Norway or Denmark. This second group of boats was ordered to remain at least thirty miles from the coast and individual boats were ordered to report any enemy movements that might concern landing operations "at once and at all costs," since air reconnaissance was inadequate to the task. The remaining boats of Group *Mitte* were held in port in a state of immediate readiness, since the situation did not yet seem to justify their putting to sea.²⁹

One inconclusive sighting was made in the Northern Transit Area on 6 June, when *U-247* was spotted north of the Shetlands. Four of 162 (BR)'s Cansos were in the air that day: 9779 and 9816 flew transit patrols from Wick to Reykjavik, with 9769 making the trip in the opposite direction. One CLA search was carried out from Wick overnight between 5 and 6 June by 9754, but nothing significant was spotted. The following day 9769 was aloft on a combined Met flight and A/S sweep, landing on the 8th, but heavy fog made transit reconnaissance patrols impractical.³⁰ U-boat activity in the transit area increased on the 8th when eleven boats of Group *Mitte* were ordered to sea to join other boats in forming a reconnaissance line surrounding southern Norway in case of Allied landings there or in Denmark.³¹ The five other submarines were the non-schnorkel boats from the eight that had been temporarily halted by BdU two days earlier. New orders were given to the other three boats from that group, which were fitted with schnorkel. In order

²⁹ BdU war diary, IX, 5-6 June 1944, 319-320, 322. The seven boats to the east of Iceland were *U-477*, *U-247*, *U-294*, *U-980*, *U-958*, *U-290*, and *U-1000*. The five schnorkel boats in the Atlantic were *U-767*, *U-988*, *U-719*, *U-1191*, and *U-671*. BdU was not yet aware that *U-477* had been sunk.

³⁰ Air Ministry, "The RAF in Maritime War," V, 17; "162 (RCAF) Squadron Operations with 18 Group from Wick," 4; 162 (BR) ORB, 6-8 June 1944.

³¹ *U-242*, *U-243*, *U-397*, *U-480*, *U-677*, *U-678*, *U-715*, *U-971*, *U-975*, *U-999*, and *U-1001* were all ordered to sea. Air Ministry, "The RAF in Maritime War," V, 10; BdU war log, "Appendix to Diary of 12.6.1944," IX, 339. On 8 June, the German Naval Staff believed that the British invasion forces remaining in Scottish and English ports were sufficient for a landing on the Norwegian coast. Hessler, The U-Boat War in the Atlantic, III, 69.

to tie down anti-submarine forces outside of the landing areas, *U-247* was sent to the Butt of Lewis area (see Map 5), while *U-233* and *U-673* were sent to the North Atlantic. One of the eleven submarines leaving for the patrol line on 8 June, *U-980*, was spotted by an aircraft that was lost to enemy action shortly thereafter, but no attacks had yet resulted from the influx of U-boats into the Northern Transit Area. Fog continued to interfere with 162's transit reconnaissance flights on the 8th, and the only aircraft on operations was 9777 which performed a convoy escort, landing shortly after midnight.³²

On 9 June, all schnorkel fitted U-boats in Group *Mitte* were ordered to proceed to the English Channel via the Atlantic. Experience had quickly shown that only schnorkel-equipped boats stood a chance of surviving in the Channel and reaching the invasion area, and at this point only twelve such U-boats were available or would soon become available for operations against the invading Allied forces.³³ Reinforcements in the form of four U-boats sailed from Kiel for Group *Mitte* on the 9th, with four more following the next day. By 10 June BdU had built up Group *Mitte* to a strength of thirty U-boats, sixteen of which were at sea.³⁴ The fog that had interfered with transit flights over the two previous days let up on the 9th, and 9816 made the flight from Reykjavik to Wick, landing on the 10th. Two Cansos, 9842 and 9754, carried out searches in the transit area, with the former sighting an empty wooden life raft and two oil drums floating in the sea, but observing no direct signs of enemy activity. Canso "A" 9796 joined the detachment in Wick on 10 June,

³² Air Ministry, "The RAF in Maritime War," V, 17; "162 (RCAF) Squadron Operations with 18 Group from Wick," 4; 162 (BR) ORB, 8-9 June 1944.

³³ These consisted of eight U-boats from Group *Landwirt* and four of the schnorkel boats (*U-767*, *U-1191*, *U-988*, and *U-671*) that had already passed through the Northern Transit Area. Hessler, *The U-boat War in the Atlantic*, III, 67-70, diagram 26.

³⁴ Air Ministry, "The RAF in Maritime War," V, 10, 17; BdU war diary, "Appendix to Diary of 12.6.1944," IX, 339. There is some uncertainty in the sources about the U-boats receiving these orders. According to page 17 of "The RAF in Maritime War," these were *U-715*, *U-971*, *U-678*, *U-423*, *U-480*, and *U-998*, but page 10 of the same work omits *U-998* and replaces *U-423* with *U-243*. According to the BdU war diary, the boats receiving these orders were *U-715*, *U-243*, *U-678*, *U-971*, and *U-480*. This appears to be the correct list, and page 10 of "The RAF in Maritime War" is in agreement with it. *U-423* only sailed from Kiel on 9 June. BdU war diary, 9-10 June 1944, "Appendix to Diary of 12.6.1944," IX, 329-330, 332, 339.

when four other aircraft were performing sweeps, two of them landing the following day. Three of 162(BR)'s Cansos were on operational flights on 11 June. Canso 9777 made an overnight transit flight to Wick from Iceland, landing on the 12th, while 9842 and 9754 carried out patrols in the Northern Transit Area. Area Beige was the first destination on 9842's patrol, but nothing was sighted. At this point, the Canso's patrol area was switched to Area Mauve, but at 1515 hours the aircraft left the patrol area when a surfaced U-boat was sighted. The aircraft was flying at 1,000 feet on a course of 343° when F/O Besley and Sgt. Roberts, the second pilot and flight engineer, sighted the submarine from the cockpit and starboard blister respectively.³⁵

The U-boat was seven miles away and twenty degrees to starboard, steering 355° at eight knots on a calm sea. Turning immediately to starboard, the Canso dove in to attack, opening fire with its starboard blister and front guns at 800 yards. Light flak, fairly accurate and concentrated, was returned by the submarine, and F/O Sherman jinked the aircraft slightly to evade the fire. The U-boat had turned to port, keeping its stern to the approaching aircraft and thus bringing all of its armament to bear. Passing across the submarine from 155° to port, the Canso released four Mark XI depth charges that straddled the boat. Three fell to port and one to starboard. One of the former exploded close to the U-boat's port side midway between the conning tower and the bow, and the four plumes completely obscured the target, which emerged from them still circling to port, although more slowly and trailing oil.³⁶

A gun duel between the Canso and the U-boat, which was sinking lower in the water and losing way, continued for some ten minutes after the attack, as the submarine

³⁵ "162 (RCAF) Squadron Operations with 18 Group from Wick," 4, 12, 19-20; 162 (BR) ORB, 9-11 June. The crew consisted of F/O L. Sherman, pilot, F/O G.W. Besley, 2nd pilot, F/O J.L. Harrison, navigator, F/Sgt. F.R. Dreger, engineer, Sgt. J.E. Roberts, 2nd engineer, F/Sgt. M.A. Gislason, WOP/AG, F/O R.R. Ward, WOP/AG, F/O F.W. Lawrence, WOP/AG.

³⁶ "162 (RCAF) Squadron Operations with 18 Group from Wick," 12-13; 162 (BR) ORB, July 1944, Form UBAT; "U/Boat Attack Assessment Form, Serial No. 1088," 11 June 1944, PRO AIR 15/137; "A Model of Speed and Precision," Coastal Command Review, 3:6 (June 1944), 9; Franks, Search Find and Kill, 46-47.

sank on an even keel, leaving oil, wreckage and about thirty-five survivors floating in the water. The patch of oil continued to expand, and oil was seen bubbling to the surface. Canso "A" 9754, which had been patrolling nearby, had intercepted the flash sighting report from 9842 at 1515 hours and homed in to the position, arriving at 1551 hours. Sherman's Canso left the scene of its attack immediately thereafter, at 1552, while the new arrival circled the position for twenty-six minutes, taking photographs.³⁷

The boat, commanded by Kapitänleutnant Hermann Dahms, was *U-980*, a Type VIIC submarine on its first patrol, forming part of the patrol line off Norway. During the run in to the attack the U-boat's schnorkel trunk was clearly seen, recessed into the deck on the port side of the submarine. The photographs taken during the attack clearly show the fitting, and were the first taken of such an installation. The boat had been fitted with schnorkel and had left Bergen on 3 June. After sighting the aircraft, the boat had managed to report an air attack, but BdU did not accept that it had been sunk until 26 June. On 18 June, *U-980* was requested to report its position, since its last report had been of the aircraft attack on the 11th. No reply was received. The boat was ordered to return to Bergen on 20 June, and on 26 June the BdU war diary recorded that "*U 980* must be reckoned as lost."³⁸

This was the second schnorkel boat sunk by 162 (BR) in June. Both *U-980* and *U-477* had been spotted on the surface, and both had decided to fight back instead of submerging to avoid attack. The reasons discussed above for *U-477*'s presence on the surface probably account for *U-980*'s actions as well. Either overconfidence on the part of the captain, inexperience with operating the schnorkel, or technical problems with the

³⁷ "162 (RCAF) Squadron Operations with 18 Group from Wick," 20; 162 (BR) ORB, July 1944, Form UBAT; "U/Boat Attack Assessment Form, Serial No. 1088," 11 June 1944.

³⁸ "U/Boat Attack Assessment Form, Serial No. 1088," 11 June 1944; Plate 2, Coastal Command Review, 3:6 (June 1944); Franks, Search Find and Kill, 46; BdU war diary, "Appendix to Diary of 12.6.1944," 18, 20, 22, 26 June 1944, IX, 340, 375, 379, 384, 399. An example of a schnorkel was captured by American troops in Toulouse, in fall 1944. Norman Friedman, U.S. Submarines Through 1945: An Illustrated Design History, (Annapolis, MD: Naval Institute Press, 1995), 356, n.34.

equipment may have led to its actions. The intensity of Allied air patrols virtually guaranteed that any U-boat on the surface in this area on 11 June would have been detected; Canso 9842 was one of twelve 18 Group aircraft flying patrols to the west and northwest of Stadlandet, although it was the only aircraft to make a sighting in the area that day. The attack also owed its success to Sherman's rapid and direct approach to the target, and the evasive action that was taken. Extensive training at Reykjavik undoubtedly did much to develop the flying techniques and accurate depth charge release that sank *U-980*. The rather light flak from the U-boat also did little to deter, distract, or destroy the attacking Canso.³⁹

Tragically Sherman had little opportunity to bask in the glory and the U-boat fleet soon exacted revenge for the loss of *U-980*. The next day, Sherman and his crew left Wick at 1755 hours to patrol Area Scarlet. At 0120 on the 13th, a flash report was received of a U-boat sighting at 64° 10' N, 0° 11' W. Nothing further was heard from Canso "A" 9842, which failed to return to base. Four Air-Sea Rescue searches were flown by 18 Group aircraft on the 13th and 14th, and two more on the 15th, but no trace of the aircraft or its crew was found.⁴⁰ The submarine Sherman sighted was *U-480*, and its flak badly damaged the attacking Canso, whose depth charges failed to inflict any damage. Sherman was forced to ditch, and only five of the eight crew managed to get into an inflatable dinghy before the aircraft sank. Flying Officer Sherman, who had been badly burned in the attack, was not among them. Without food, water, or survival equipment, the survivors drifted on high seas. One of the crew died of exposure a week after the crash, and three more, suffering hallucinations from the effects of drinking salt water, threw themselves over the side during the following days. Only one of the Canso's crew, Flight Sergeant J.E. Roberts, remained alive, and he was rescued by a Norwegian whaling vessel some 135

³⁹ Air Ministry, "The RAF in Maritime War," V, pt. 1, 17, 17, n.5; "162 (RCAF) Squadron Operations with 18 Group from Wick," 13.

⁴⁰ *ibid.*; 162 (BR) ORB, 13 June 1944

miles off the Norwegian coast on 22 June. Attempts to find a sympathetic doctor in Alesund were unsuccessful, and the Norwegians were forced to turn Roberts over to the “German hangmen” in order to receive medical treatment. Roberts, who actually received good treatment while in captivity, was eventually liberated from a prisoner-of-war camp near Berlin by Allied forces in May 1945. When news was received of the loss of the aircraft on 13 June, the immediate award of a DFC was made to F/O Sherman, for the sinking of *U-980*, since such awards could not be made posthumously.⁴¹

Five more of the squadron’s aircraft had been airborne on 12 June; 9808 was on a transit flight from Wick to Reykjavik, while the other four were on searches, two landing on the 13th. On 13 June, two more aircraft were aloft. Canso “A” 9754 carried out a transit reconnaissance from Wick to Reykjavik, while 9816, commanded by Wing Commander Chapman, the squadron’s OC, was flying a patrol north of the Shetlands. At about 1000 hours, in approximately 62° 45’ N, 02° 59’ W, *U-715*, a type VIIC submarine, decided to come to periscope depth in order to schnorkel, but rose too quickly and exposed too much of the schnorkel tube. At 1012 hours, F/O McRae, co-captain of Canso 9816, sighted the feather from “two periscopes” three miles away and ninety degrees to starboard.⁴² The aircraft was flying a course of 334° at between 700 and 800 feet, while

⁴¹ 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), 593; F/O H.A. Halliday to AOC, Maritime Air Command, 1 April 1964, 2, 162 (BR) ORB, July 1944. Only the Victoria Cross (VC) and a mention in Dispatches (MiD) could be awarded posthumously. *U-480* sank the Canadian corvette *Alberni*, the British minesweeper *Loyalty*, and a merchant ship south of the Isle of Wight in late August 1944. The submarine was sunk off Land’s End on 24 February by HMS *Duckworth* and *Rowley* of Escort Group 3 and Escort Group 15. Marc Milner, The U-Boat Hunters: The Royal Canadian navy and the Offensive against Germany’s Submarines, (Toronto: University of Toronto Press, 1994), 174, 234; Jürgen Rohwer, Axis Submarine Successes, 1939-1945, (Annapolis: U.S. Naval Institute Press, 1983), 184, 185; Tarrant, The Last Year of the Kriegsmarine, 241.

⁴² “162 (RCAF) Squadron Operations with 18 Group from Wick,” 4; 162 (BR) ORB, 12-13 June; “Details of Attack on U-715,” 1012/13/6/44, NAC RG 24, vol. 11464, “A/S War (1939-1945) Details of Attacks”. The crew consisted of W/C C.G.W. Chapman, OC 162 (BR) and co-captain, F/O J.M. McRae, co-captain and 1st pilot, P/O D.J.C. Waterbury, navigator, F/Sgt. H.C. Leatherdale, engineer, Sgt. R.F. Cromarty, 2nd engineer, W/O F.K. Reed, 1st WAG, W/O J.J.C. Bergevin, 2nd WAG, and F/Sgt G.F. Staples, 3rd WAG.

the periscopes were travelling at an estimated 270° at three knots. At the same time, the submarine commander spotted the aircraft and decided that the only course of action was to surface and fight it out with the attacker. Turning to starboard and losing height, the Canso made an attack along the U-boat's length at an angle of 30° to starboard. In addition to the two periscopes, one of which may have been the boat's schnorkel, the conning tower had emerged from the water. The captain and the flak gunners rushed on to the bridge, but machine gun fire from the approaching aircraft killed three of the gunners. The Canso passed over at fifty feet, straddling the U-boat with four depth charges, three of which were seen to explode.⁴³

The two depth charges exploding near the U-boat's bow caused a severe leak in the bow compartment and leaks through the hydrophone lead glands. The torpedo loading hatch was also forced open, but one of the crew managed to shut it again. Continuing on a straight course for approximately twenty seconds, the aircraft then turned hard to port. By this time the submarine had surfaced and its decks were awash as it proceeded slowly on the surface, turning to starboard. Canso 9816 proceeded to circle the wounded submarine, which eventually turned to a course of 330° and then came to a stop, having travelled some 400 yards since the attack. The U-boat began to settle by the bows and the stern emerged from the water, both screws plainly visible but not turning, while many of its crew were seen in the water and the conning tower disappeared below the surface. Bow-heavy, the submarine had begun to sink at an angle of eighty degrees. Acid spilled from the batteries, but fortunately for the crew no chlorine gas formed. Using its remaining compressed air, the submarine managed to halt its descent and bring itself back to the surface. The

⁴³ "U/Boat Attack Assessment Form, Serial No. 1089," 13 June 1944, PRO AIR 15/137; 162 (BR) ORB, July 1944, Form UBAT; Franks, Search Find and Kill, 47; "The End of 'U 715'," Coastal Command Review, 3:7 (July 1944), 8. If the boat was coming to schnorkel depth, its batteries were probably not at full charge, and so submerging again to avoid the attack was probably not a viable option, especially if the Canso were to call in surface ships or other aircraft. Furthermore, the submarine would have to be trimmed to dive again, and its supply of compressed air was also apparently quite low. "The End of 'U 715'," 8.

commander and the gunners, who had been left in the water, then climbed back on board.⁴⁴

The Canso made several runs over the boat to take photographs, but then the conning tower began to reappear, and as the aircraft was making another run in, one of the submarine's crew ran to the 37mm gun and opened fire. Without a chance to alter course, the Canso jinked violently, but just after passing over the U-boat an explosion was heard and the port engine began to leak oil and belch black smoke. It was shut off by the crew, but the propeller could not be feathered, and fuel could not be jettisoned to reduce the Canso's weight due to the fear of fire.⁴⁵ Despite full boost to the starboard engine, the aircraft sank slowly from 1,000 feet towards the sea, and after hitting wave tops, the captain ditched successfully at 1025. The aircraft filled rapidly and sank within ten to fifteen minutes, since the U-boat's flak had blown two or three holes "large enough to take boots" in the amphibian's hull.⁴⁶ All eight of the Canso's crew, clad in immersion suits, abandoned the aircraft, taking cameras, film, and operational documents with them. Unfortunately the port dinghy exploded after striking a sharp projection on the aircraft, and all eight were forced to rely on the starboard dinghy, which had two holes in it. Two crew members and the salvaged equipment were in the dinghy, while the remainder hung on to the sides. Attempts to change places frequently were thwarted when three of the crew's

⁴⁴ "U/Boat Attack Assessment Form, Serial No. 1089," 13 June 1944, PRO AIR 15/137; 162 (BR) ORB, July 1944, Form UBAT; Franks, Search Find and Kill, 47; "Details of Attack on U-715," 1012/13/6/44, NAC RG 24, vol. 11464, "A/S War (1939-1945) Details of Attacks"; "The End of 'U 715'," Coastal Command Review, 3:7 (July 1944), 8. The survivors claimed that U-715 plunged to 100 metres after the attack, but this is not consistent with the attack report made by the aircrew, which does not mention that the U-boat disappeared completely from the surface, which would have been necessary to attain a depth of 100 metres, even at an 80° angle of dive. In all likelihood, damage to the depth gauges and other instruments probably led to the survivors' claims.

⁴⁵ Feathering a propeller turned its blades so that they were parallel to the airstream, which reduced aerodynamic drag. Fuel could not be jettisoned until the engine had stopped, and by that point the aircraft was at very low altitude. "Questionnaire Regarding Forced Alighting of Canso 'A' 9816 on 13th June, 1944," 1, NAC RG 24, vol. 3412, file HQ.466-2-2, vol. 2, "Air/Sea Rescue Services - RCAF Aircraft Ditchings - Report On".

⁴⁶ Two holes measuring approximately 18" by 8" were blown in the hull near the keel in the engineer's compartment, while another, approximately 6" in diameter, was in the starboard side of the hull just forward of the fin. *ibid.*

immersion suits became so badly waterlogged that they could not be pulled on board the dinghy. By that time, all of the crew were suffering from the cold, and in order to keep the dinghy afloat the salvaged equipment from the aircraft was jettisoned.⁴⁷

In the meantime, *U-715* was damaged beyond repair and was leaking so badly that the order was given to abandon ship. The commanding officer, Kapitänleutnant Helmut Rottger, had by this time “completely lost control of himself”, and had given no orders following the attack. The engineering officer took control, and everyone but him and three others managed to abandon ship. After remaining on the surface for five minutes, the U-boat sank. The commanding officer, first lieutenant and second lieutenant, all of whom had individual floats and lifejackets, gave them up to others, and one survivor reported seeing the commander shoot himself.⁴⁸

Meanwhile, not far away, a Liberator was sighted by the *Canso*'s crew but turned away. At 1147, however, it returned and circled the dinghy, dropping a package which fell some distance away and was not recovered. About thirty minutes later a Sunderland arrived and dropped smoke floats, and shortly afterwards, at 1300 hours, Warwick U/281 appeared and dropped an airborne lifeboat, which landed about 175 feet downwind.⁴⁹ The navigator, P/O Waterbury, then removed his clothing, and wearing a Mae West lifejacket swam to the lifeboat, reaching it at about 1317 hours. Unfortunately, the lifeboat was damaged by its landing and was low in the water, the port gunwale being almost at water

⁴⁷ “U/Boat Attack Assessment Form, Serial No. 1089,” 13 June 1944, PRO AIR 15/137; 162 (BR) ORB, July 1944, Form UBAT; Franks, *Search Find and Kill*, 47; AOC-in-C, EAC to Secretary, DND for Air, “Reports of R.C.A.F. Ditchings,” 27 September 1944, 2, “Questionnaire Regarding Forced Alighting of *Canso* ‘A’ 9816 on 13th June, 1944,” NAC RG 24, vol. 3412, file HQ.466-2-2, vol. 2, “Air/Sea Rescue Services - RCAF Aircraft Ditchings - Report On”; This file contains useful information about the loss of several of the squadron's aircraft.

⁴⁸ “The End of ‘U 715’,” 8.

⁴⁹ Warwick U/281 had apparently been on a transit flight from Wick to Sumburgh, in the Shetlands. It was in the circuit over Sumburgh, preparing to land, at the time it received the request to proceed to the position where *Canso* 9816 had ditched. Stephen Brewster Daniels, *Rescue from the Skies: The Story of the Airborne Lifeboats*, (London: HMSO, 1993), 48-49. Unfortunately, there is some confusion in Daniels' book between this rescue and a later rescue involving a 162 (BR) crew, and careful attention is needed to sort the information out. For a description of the Airborne Lifeboat and its operational use, see *ibid.*

level and the deck awash. Nevertheless, Waterbury paddled the lifeboat back to the dinghy, reaching it at about 1347 hours. Shortly before this, F/S Leatherdale, one of the Canso's flight engineers, died, apparently from the effects of exhaustion and exposure. Boarding the lifeboat from the dinghy proved difficult, largely because the crew were exhausted due to their waterlogged ditching suits and the efforts required to assist Leatherdale, as well as W/O Reed and F/S Staples, who were all showing signs of distress. Eventually, all boarded the lifeboat, but it was not possible to get Leatherdale's body into the lifeboat, and it drifted away. The hands and feet of the ditching suits were cut away after the crew boarded the lifeboat, releasing the water the suits contained, but it was found that Reed and Staples still required assistance to keep their heads above the water on deck, and the effort required to lift them on to the inflatable canvas bows of the boat was temporarily beyond the exhausted crew.⁵⁰

At about 1450, a second Warwick arrived and dropped a smoke float. After making several runs over the lifeboat, it dropped Lindholme Gear, which, due to the lifeboat's waterlogged condition, could not be reached. A second set of gear was dropped, landing some fifty yards away, and this time it was recovered. Although the dinghy was punctured by one of the oarlocks on the lifeboat, drinking water was obtained from the other containers. The dinghy itself was used as a bed for one of the exhausted crew. At 1613, the crew managed to erect the mast, which provided a substantial point to hang on to. Less than three hours later, at approximately 1900, a High Speed Launch (HSL), probably HSL 2723, arrived from Lerwick to pick up the crew. Unfortunately, neither Reed nor Staples could be revived, despite the ministrations of the HSL's crew.⁵¹ For his part in the action, Wing Commander Chapman received an immediate Distinguished Service Order (DSO); Flying Officer McRae, Pilot Officer Waterbury, and Warrant Officer

⁵⁰ 162 (BR) ORB, July 1944, Form UBAT; Daniels, Rescue from the Skies, 48-49; "Questionnaire Regarding Forced Alighting of Canso 'A' 9816 on 13th June, 1944 - Narrative," NAC RG 24, vol. 3412, file, "Air/Sea Rescue Services - RCAF Aircraft Ditchings - Report On".

⁵¹ *ibid.*; Daniels, Rescue from the Skies, 48-49.

Bergevin received the Distinguished Flying Cross (DFC), and Sergeant Cromarty received the Distinguished Flying Medal (DFM).⁵²

The crew of *U-715* had also been spotted by aircraft arriving on the scene, and Warwicks U/281 and V/281 both dropped Lindholme Gear to the survivors in the water. Air coverage was provided until surface ships arrived and rescued seventeen of the crew from *U-715*. The submarine had been on its first patrol, leaving Stavanger on 8 June. The commander, Kapitänleutnant Helmut Rottger, who had apparently served earlier in the Luftwaffe, had been making extensive use of radar decoy balloons, and believed that they had revealed the U-boat's course to shadowing aircraft. Called Aphrodite by the Germans, the decoys used hydrogen-filled balloons to which aluminum foil was attached in order to produce a radar echo similar to that of a U-boat. It was effective only against metric radar, such as ASV Mark II, as opposed to the more recent centimetric radar. Even though the decoys might have proved effective against the radar carried by 162's Cansos, it had no effect on their operations because their radar was rarely used in patrol areas by this time. The commanding officer's fears that the decoys had disclosed his course were groundless, but they demonstrated the effect of Allied maritime air power on the morale of at least some members of the U-boat arm.⁵³

In *The RAF in Maritime War*, Peyton-Ward describes the attack on *U-715* as the first success against a schnorkelling U-boat, but this is not strictly accurate. The submarine was not schnorkelling at the time, but was coming to schnorkel depth when poor handling of the boat led to an excessive exposure of the schnorkel head and periscope that was sighted from the Canso. Since the initial sighting was of the schnorkel head and periscope, however, had *U-715* been schnorkelling it would probably have been spotted and attacked,

⁵² "Honours and Awards: No. 162 (BR) Squadron," compiled by Hugh Halliday.

⁵³ Daniels, *Rescue From the Skies*, 49; "The End of 'U 715'," 8; Hessler, *The U-Boat War in the Atlantic*, III, 5; Air Ministry, "The RAF in Maritime War," IV, 470. The narrative of squadron operations from Wick mentions the use of radar only rarely. "162 (RCAF) Squadron Operations with 18 Group from Wick," *passim*.

although the attack might have had less of a chance of success due to the much smaller target presented by the schnorkel as compared to an emerging conning tower. The loss of Canso 9816 in the aftermath of the attack was the result of bad luck as well as pressure on the part of Coastal Command to obtain photographs of U-boats attacked. The UBAT form used to record information about attacks stated that "Photographs are of the greatest value. . . . If none taken, why not?" The Reykjavik Station Commander believed that "the loss of the a/c due to the determination of a solitary gunner on a sinking platform could hardly have been foreseen, but it is felt that the importance at present attached to photographs as distinct from visual evidence may have led the pilot to take a risk which he would otherwise have avoided."⁵⁴ The risk was taken, and an extraordinary series of events led to the loss of the aircraft and three of its crew.

So far, 162 (BR) had destroyed three U-boats since its arrival in Iceland, and had lost two Cansos to enemy fire. More was to come, however, after a brief hiatus. On 14 June, only one of the squadron's aircraft, 9777, was on patrol in the Northern Transit Area, sighting nothing of importance. Mosquito H/333 made the only contact with a submarine in the area that day, when it attacked *U-290* with a single depth charge and cannon fire, damaging the submarine and forcing it to return to port with wounded crew members.⁵⁵ Three Cansos were on transit flights, 9769 from Wick to Reykjavik, and 9754 and 9808 in the opposite direction. Both 9754 and 9808 sighted a small vessel in the transit area, but saw nothing else of importance. Another aircraft, 9796, was on patrol from Iceland, and 9841, which had flown to Canada for servicing in May, began preparations for a return to Reykjavik.⁵⁶ The following day, no submarine sightings were

⁵⁴ Air Ministry, "The RAF in Maritime War," V, 17, n. 4; 162 (BR) ORB, July 1944, Form UBAT, 5.

⁵⁵ "162 (RCAF) Squadron Operations with 18 Group from Wick," 12; Air Ministry, "The RAF in Maritime War," V, 17; "A Mosquito Attack with one Depth Charge," Coastal Command Review, 3:6 (June 1944), 10; Franks, Search Find and Kill, 47.

⁵⁶ "162 (RCAF) Squadron Operations with 18 Group from Wick," 4, 5; 162 (BR) ORB, 14 June 1944.

made in the Northern Transit Area by Allied aircraft, but Canso "A" 9808 had an unnerving encounter with a German aircraft. Taking off at 0116 hours, it was headed for Area Red 49, and at 0340, just after entering the search area at 61° 30' N, 01° 00' W, a Junkers Ju-88 appeared, flying on a course of 270° at 700 feet. F/O Marshall put the Canso into a steep climb, passing over the enemy aircraft at 1,000 feet.⁵⁷ Canso 9754 carried out a less eventful patrol overnight from the 15th to the 16th, sighting a floating mine and three Swedish merchant vessels. The detachment in Wick was reinforced by 9769, which left Reykjavik to join the detachment in Wick on the 15th, flying a transit reconnaissance from Reykjavik and landing the following day. Again, only one aircraft was on operational flying from Reykjavik; 9796 flew a CLA sweep, landing on the 16th.⁵⁸

The Mosquitoes of 333 Squadron were again active in the Northern Transit Area on 16 June, H/333 damaging *U-998* so severely that it had to be scrapped on return to port, and forcing *U-804*, going to its assistance, to put back to port with eight wounded following an attack by R/333 in which the aircraft was lost to flak. Two patrols by 162 (BR) Cansos were scheduled in the transit area, but only 9769, which had arrived early on the 16th, carried out an overnight patrol. Canso 9808 also took off on a patrol, but an "alarming" fuel leak forced it to return to base. One of the detachment, 9777, returned to Reykjavik on the 16th, where bad weather late in the day kept 9779 from carrying out an anti-submarine search. On the 17th, one of 333 Squadron's Catalinas sank the schnorkel-equipped *U-423* northwest of Kristiansand. With one exception, this was to be the last attack in the Northern Transit area until 24 June.⁵⁹ The continuing success of the Allied landings in Normandy and the inability of any but schnorkel-equipped boats to survive in

⁵⁷ "162 (RCAF) Squadron Operations with 18 Group from Wick," 17. The Junkers Ju-88 was a twin-engined medium bomber employed in a variety of roles throughout the war, including bomber, night fighter, and reconnaissance duties.

⁵⁸ *ibid.*, 21-22, 162 (BR) ORB, 15-16 June 1944.

⁵⁹ Air Ministry, "The RAF in Maritime War," V, 17, 18; "162 (RCAF) Squadron Operations with 18 Group from Wick," 15, 17, 5; 162(BR) ORB, 16-17 June 1944; Tarrant, The Last Year of the Kriegsmarine, 237. Both Mosquitoes and Catalinas were operated by 333 Squadron.

the face of Allied anti-submarine forces in the area led BdU to order the next six schnorkel boats entering the Atlantic to make for the Channel at their maximum possible continuous speed, submerging only after reaching the southwestern approaches to the British Isles.⁶⁰

The weather that had interfered with 162's operations from Iceland on the previous day persisted on the 17th, when 9796, scheduled to fly from Reykjavik to Wick, had its patrol postponed indefinitely due to poor weather in the patrol area. Weather in the Northern Transit Area was better; two patrols were flown in the area on the 17th. Canso "A" 9754 actually flew two patrols that day, although the second began very late and would not have reached the patrol area until early on the 18th. The other aircraft on patrol, 9808, had an experience that illustrated some of the difficulties of communication between aircraft and their bases. On its way to Area Green 18, 9808 reported a floating mine, and one hour later received a message from base asking why the signal had been sent and inquiring if they needed any assistance.⁶¹ Assistance had been the purpose of the only operational flight from Reykjavik on the 17th. Canso "A" 9779, flown by F/O Lawless and crew, was dispatched on an ASR mission for a Soviet PBN-1 "down somewhere between here [Reykjavik] and Murmansk." Nothing was found, and the ORB noted that

the sweep he was to do at one time during this briefing would have taken him to 73° [N] - 10° E. There would have been only one place for him to go had he completed the sweep - Murmansk, so they cut the trip short.⁶²

⁶⁰ Hessler states that "since the enemy had chosen to establish his bridgehead in Seine Bay [Normandy], it was abundantly clear that only schnorkel boats had any chance at all of attacking his supply traffic, and that even they would be running a grave risk in so doing." Hessler, The U-Boat War in the Atlantic, III, 69. The U-boats given these orders were *U-971*, *U-715*, *U-480*, *U-678*, *U-423*, and *U-243*. BdU was not yet aware of the loss of *U-715*. The orders were for submerged passage only after reaching square BE, to the northwest of the British Isles. BdU war diary, 17 June 1944, IX, 373, DHist 79/446.

⁶¹ "162 (RCAF) Squadron Operations with 18 Group from Wick," 5, 17-18, 22; 162 (BR) ORB, 17-18 June 1944.

⁶² *ibid.*, 17-18 June 1944. The PBN-1 Nomad was an extensively modified version of the PBV-5 flying boat. The majority of these aircraft were delivered to the Soviet Union using Soviet crews. In this case PBN-1 02826, carrying Col. V.N. Vasilyov, USSR, and a Soviet delivery crew was lost. W.E. Scarborough, PBV Catalina in action, (Carrollton, TX: Squadron/Signal Publications, 1983), 36; Carl A. Christie and Fred Hatch, Ocean Bridge: The History of RAF Ferry Command, (Toronto: University of Toronto Press, 1995), 324.

There were only two operational flights by the squadron on 18 June. The detachment in Wick was reinforced by 9777, which flew a transit reconnaissance from Reykjavik to Scotland, while 9754, which had taken off late on the previous day, carried out a patrol north of the Shetlands. Canso "A" 9841, which had been sent to Canada for a major inspection and overhaul, began its return flight to Iceland the same day, flying from Moncton to Goose Bay.⁶³

The squadron carried out transit reconnaissances on 19 June, but no patrols in the Northern Transit Area or elsewhere. Three Cansos, 9754, 9796, and 9808, flew from Wick to Reykjavik. The first two aircraft were ordered back to Wick the following day, but weather forced the postponement of their flights. Two other aircraft, 9769 and 9777, however, were airborne from Wick on patrols, 9769 sighting only a wooden ship's raft in its patrol area. Liberator K/86 made the first attack in the Northern Transit Area since 17 June on the 20th, when it damaged the Atlantic-bound *U-473*, which was forced to put back to Bergen to repair damage and to land a badly wounded crew member.⁶⁴ On 21 June, 9796 and 9754, which had been delayed by weather the previous day, made the flight from Reykjavik to Wick. Both flights were carried out at an average height of 3 to 4,000 feet, and 9754 made the only significant sighting, reporting a floating mine off northern Scotland.⁶⁵ It was on this day that BdU realized that *U-477*, which had been destroyed by F/L McBride and crew on 3 June, as well as *U-675* and *U-292*, sunk by air attack on 24 and 27 May respectively, were lost. None of the three boats had responded to repeated calls, and, the BdU war log concluded, "it is therefore presumed that all 3 boats

⁶³ 162 (BR) ORB, 17-18 June 1944; "162 (RCAF) Squadron Operations with 18 Group from Wick," 5, 22.

⁶⁴ *ibid.*, 5, 15; 162 (BR) ORB, 19-20 June 1944; Air Ministry, "The RAF in Maritime War," V, 18; BdU war diary, 20 June 1944, IX, 378, 379.

⁶⁵ "162 (RCAF) Squadron Operations with 18 Group from Wick," 5; 162 (BR) ORB, 21 June 1944.

fell victim to the considerably increased air patrol - partly fast land-based planes (Mosquitoes) while on their northward passage along the Norwegian coast.”⁶⁶

Poor weather in Reykjavik and unrecorded factors in Wick meant that no operational flights were carried out by 162 (BR) on 22 June, with the exception of a search by 9769, which took off just before midnight for a patrol in the Northern Transit Area, landing after noon on the 23rd. With the exception of a small oil slick, nothing of importance was sighted.⁶⁷ Other aircraft were patrolling from Wick on the 23rd; Canso 9754 was assigned to Area Oboe Green, but returned to base after developing a fuel leak, while 9777 and 9796 appear to have carried out their patrols.⁶⁸ Meanwhile in Reykjavik, Canso 9841, which had left for a major inspection and overhaul in Canada on 17 May, arrived from Blue West I. Three aircraft flew transit reconnaissances on the 24th; 9755 and 9767 from Reykjavik to Wick, and 9769 from Wick to Reykjavik, while three others, 9777, 9796, and 9754, were patrolling in the Northern Transit Area. Nothing was sighted by the first two Cansos except friendly aircraft, and 9796 landed at Sumburgh, in the

⁶⁶ Tarrant, *The Last Year of the Kriegsmarine*, 236; BdU war diary, 21 June 1944, IX, 381. Ironically, *U-477* was sunk by a Canso, *U-675* by a Sunderland of 4 OTU, and *U-292* by a Liberator of 59 Squadron. The numerous Mosquito attacks by 333 Squadron which damaged but did not sink U-boats appear to have made an impression on the German commanders, and the rescue of the crew of a 333 Squadron Mosquito and their subsequent interrogation appears to have reinforced this concern. BdU war diary, 18 June, 15 July, “Serial Order No. 14, July 1944 Issue,” IX, 375, 451, 452.

⁶⁷ “162 (RCAF) Squadron Operations with 18 Group from Wick,” 15.

⁶⁸ There is some uncertainty in the records about which aircraft had gas leaks and which crew was flying it. Both sources agree that on 21 June, F/O Leech and crew brought 9754 to Wick. The squadron ORB claims that on the 23rd, Leech was flying 9777 when it had the gas leak, while F/L Hornell was flying 9754 which completed its patrol. The narrative of 162 (BR) flying operations from Wick, however, claims that F/O Leech was flying 9754 at the time it experienced the gas leak. F/L Hornell had brought 9777 to Wick on 18 June, and was flying 9754 on 24 June, so this appears to be an understandable error in the ORB. On the 24th, F/O Leech and crew left for a patrol early in the day, flying 9777. This would make sense if they had not flown a full patrol the day before, which would free them up for an early morning flight, but the gas leak in 9754 might have forced them to take 9777 on the patrol, leaving 9754 for Hornell and his crew. An examination of the narrative of 162 (BR) flying operations from Wick shows that it was very unusual for crews to fly aircraft other than those they flew to and from Wick. “162 (RCAF) Squadron Operations with 18 Group from Wick,” 20, 5; 162 (BR) ORB, 18-24 June 1944.

Shetland Isles.⁶⁹ Canso "A" 9754, carrying F/L D.E. Hornell and crew, however, was to have an encounter that has since become known as the most famous event in the history of 162 (BR).⁷⁰

Leaving Wick at 0940 in the morning, 9754 was assigned patrol Area Green Oboe, but at 1125 Hornell's Canso was diverted to Area Green 19. Its patrol completed just after 1800 hours, the aircraft was returning to base, flying at 1200 feet. At 1858, F/S Bodnoff, in the Canso's port blister, sighted a wake distant five miles and 90° to port which was quickly identified as a U-boat. The submarine was making a "terrific wake", moving along at fifteen to seventeen knots on a course of 40°. Bodnoff informed Hornell of the sighting, the klaxon was sounded for action stations, and the Canso turned in to attack. At four miles' range the U-boat opened fire and turned approximately 80° to starboard to allow all its guns to bear on the attacking aircraft. The flak intensified as the Canso approached its target, and Hornell began to undulate the Canso up and down in order to avoid the fire. At 1200 yards, F/O Campbell opened fire with the front-mounted machine guns, scoring hits on the conning tower despite the aircraft's evasive manoeuvres, and some of the submarine's crew appeared to be hit. The starboard gun soon jammed, but Campbell maintained fire with the port gun. The other two gunners also opened fire on the submarine during the attack.⁷¹

⁶⁹ 162 (BR) ORB, 23 June, 17 May 1944; "162 (RCAF) Squadron Operations with 18 Group from Wick," 5, 20; 162 (BR) ORB, 24 June 1944. The former source incorrectly identifies 9767 as 9808. The crews and flight times recorded for 9767 in the ORB correspond with those given for 9808 in the narrative, and 9808 seems to have been grounded for servicing at this time, since no flights are recorded for it between 20 and 25 June. The task of identifying which aircraft were flying on given days is complicated by the use of serial numbers in the ORB and identification letters in the narrative of operations from Wick.

⁷⁰ The crew consisted of F/L D.E. Hornell, co-captain, F/O B.C. Denomy, co-captain, F/O S.E. Matheson, navigator, F/O G. Campbell, 1st W/OP, F/S I.J. Bodnoff, 2nd W/OP, F/S S.R. Cole, 3rd W/OP, Sgt. F. St.Laurent, engineer, and Sgt. D.S. Scott, engineer.

⁷¹ 162 (BR) ORB, July 1944, Form Orange 1/SUL/04/27 June 44; *ibid.*, Form UBAT; "U-Boat Attack Assessment Form," Serial 1104, PRO AIR 15/137; Interview of F/S I.J. Bodnoff, July 1944, 162 (BR) ORB, June 1944; F/O B.C. Denomy to G/C Conn, n.d., 162 (BR) ORB, June 1944; Graham Campbell, "How the VC Was Won," *Airforce*, 8:2 (June-August 1984), 2, 20; 162 (BR) ORB, July 1944, Form UBAT. Although Sgt. Scott was one of the engineers, he was manning the starboard blister because F/S Cole was operating the radio during the attack.

As the Canso closed to 800 yards the U-boat's gunners began to score hits. Two large holes appeared in the trailing edge of the starboard wing, and a smaller hole was blown in the starboard side of the fuselage near the radio set. At 500 yards it was noticed that the starboard engine had been hit and was pouring oil, while the trailing edge of the starboard wing and the de-icer boots on its leading edge had caught fire. F/O Denomy, the other pilot, gave full boost to the port engine, and managed to feather the starboard engine, which eventually came to a complete stop as the Canso passed over the submarine. At 200 to 300 yards' range, the U-boat ceased firing and turned sharply to port, bringing itself broadside on to the attacking aircraft, forcing Hornell to make a more difficult beam attack rather than the approach from astern that he had been making. Hornell managed to turn the aircraft, which was becoming increasingly difficult to control, and the depth charges straddled the submarine about forty feet from its bow. Denomy and F/O Matheson, the navigator, both witnessed the straddle, and Sgt. Scott, one of the engineers, saw the explosion of the depth charges, when the bows of the U-boat "seemed to lift right out of the water then settle back."⁷² The Canso managed to gain height following the release of the depth charges, clawing up to 250 feet at about 80 knots. However, the fire in the starboard wing was still burning, while the starboard engine continued to vibrate and eventually fell out of the wing and into the sea. The aircraft could no longer stay airborne, and bringing the Canso into the wind and swell, the pilots managed to ditch the aircraft, which bounced twice before coming to rest.⁷³

When the U-boat had been sighted, F/O Matheson, the navigator, had given the aircraft's position to F/O Campbell, who sent it to base along with the attack report. After sending this signal, Campbell had gone forward to the nose guns, and F/S Cole took over the radio. During the attack, Cole had been sending out sighting reports on the radio, but

⁷² 162 (BR) ORB, July 1944, Form UBAT; "U-Boat Attack Assessment Form," Serial 1104, PRO AIR 15/137; Campbell, "How the VC Was Won," 2; F/O B.C. Denomy to G/C Conn, n.d..

⁷³ *ibid.*

he was thrown from his seat by the blast of the shell that blew the hole in the starboard side of the fuselage. When Campbell came back from the nose turret after passing over the U-boat, he found Cole temporarily stunned, so Campbell began sending a position report and then an S.O.S., after which he fastened down the key in order to send a continuous signal so that shore stations could take a bearing. The navigator, F/O Matheson, had also been affected by the explosion, but his injuries were confined to a small shrapnel wound to the head. The blast that knocked down Cole and Matheson also apparently disabled the radio set, since none of the messages sent by the stricken aircraft were received by anyone.⁷⁴

Once the Canso had come to a stop, the crew abandoned the aircraft. Hornell and Denomy left the cockpit through the roof hatches in the canopy. Scott and St.Laurent launched the dinghies, one from each blister. St.Laurent threw the starboard dinghy into the water and jumped in after it, finally inflating it upside down some 100 feet away from the aircraft, apparently because of flames from the burning starboard wing. He managed to right the dinghy but was unable to climb in due to the weight of his flying clothing. Scott inflated the port dinghy and launched it, with Hornell, Denomy, and Matheson swimming out to it from the aircraft. Scott and Bodnoff were already in the dinghy, but Campbell and Cole were still in the aircraft. They did not realize that the starboard dinghy had been launched, and were searching for it in the smoke-filled aircraft. Cole managed to find a water can and some ration tins, passing them to Campbell, and both of them then boarded the port dinghy, which had been paddled back to the aircraft. As they were pulling away, Cole jumped in the water to swim back to the aircraft and get the dinghy radio, but he was grabbed by the other crew members and pulled back aboard, since the fuel tanks might explode as a result of the fire and the dinghy needed to clear the burning aircraft as quickly

⁷⁴ 162 (BR) ORB, July 1944, Form UBAT; "U-Boat Attack Assessment Form," Serial 1104, PRO AIR 14/137; Campbell, "How the VC Was Won," 2. There is some disagreement in the sources about whether Campbell or Cole sent the signals immediately prior to ditching. Both the official documents state that Campbell took over the set and sent the messages, while Campbell's article states that Scott did so.

as possible. Within eight to ten minutes, the Canso sank until its wing was level with the water, and it disappeared entirely within twenty minutes, leaving a "huge column" of black smoke rising into the air.⁷⁵

Paddling the port side dinghy to the other dinghy about 100 yards away, the crew managed to right it and were in the midst of transferring some of the crew to it when it exploded. All of the crew, with the exception of Scott and Cole, were now in the water, and the food and much of the other equipment on board the dinghy was thrown overboard in order to make room for more of the crew, and also because it was feared that the sharp edges on the tins might cause a puncture. Since it was not found possible to fit everyone in the dinghy, the crew took turns in the water, hanging on to its edges.⁷⁶ At 2250 hours, the survivors sighted a Catalina on a course heading away, and Campbell used the three available flares to attract its attention. Had the signals not been used, the crew of the Catalina would have missed the dinghy despite the lookouts in the aircraft. Flying low over the dinghy, the Catalina, D/333, released smoke and flame floats to mark the dinghy's position, and reported its sighting to base. Orders were received to remain over the dinghy and wait for further instructions. This Catalina was to be the first of several Norwegian aircraft that played an essential role in the rescue of the crew.⁷⁷

At about this time, the crew found it possible to fit everyone in the dinghy, with the exception of Scott, whose feet hung over the side. They were all in fairly good shape at this point, and received messages via Aldis Lamp from the circling Catalina that help was on the way. Just after midnight, the crew of the orbiting Catalina observed a growing oil patch some three miles to the west. After dropping markers to indicate the dinghy's

⁷⁵ "Crash Alighting of Flying Boat," DHist 181.009 (D2441); 162 (BR) ORB, July 1944, Form UBAT; Interview of F/S I.J. Bodnoff, July 1944, appended to 162 (BR) ORB, June 1944.

⁷⁶ 162 (BR) ORB, July 1944, Form UBAT; F/O Denomy to G/C Conn, n.d.; "How the VC was Won," 20. There is some confusion in the various accounts about who was in the water and who was in the dinghy at various times.

⁷⁷ Campbell, "How the VC Was Won," 20; 162 (BR) ORB, July 1944, Form Orange SUL/07/25 June 1944. There is extensive information, compiled by Hugh Halliday, on the part played by the Norwegians in this rescue in Hornell's biographical file.

position, the aircraft went to investigate. Thick brownish-black oil was coming to the surface, and some thirty-five to forty people were seen in the water, some apparently living and some dead. On returning to the dinghy, news of the sighting was signalled to the crew, who had not known the outcome of their attack. Evidence of its success boosted their morale, as did the news received shortly after one in the morning that a High Speed Launch (HSL) and two ASR Warwicks were on their way. At about 0300, evidence of the attack floated by the survivors. A body wearing a yellow life jacket floated by, followed by a large piece of planking, proof that a submarine had been sunk.⁷⁸

In the meantime, rescue efforts had begun. High Speed Launch 2507 was dispatched from Muckle Flugga in the Shetlands, the most northerly point in the British Isles, and headed north through increasingly bad weather to reach the survivors. The worsening weather also ruled out any attempted landing by the Catalina to rescue the crew in the dinghy. By early morning the wind had risen to forty-six knots and the swells to fifty feet. At 0635 the Norwegians signalled base, asking if the launch was on the way and requesting further instructions. They were informed that the HSL was expected within a half hour and that two more Warwicks had been dispatched. The HSL was not to arrive as planned. An hour after leaving base, one of its engines had to be shut down, reducing its speed, and its signals outlining its problems were not received by the base, which explained the unrealistic time of arrival given in the signal to D/333. The situation became even more urgent when the dinghy capsized at 0840 on the 25th. Everything on board, including the baling bag, was lost, and a tremendous effort was required in order to right

⁷⁸ 162 (BR) ORB, July 1944, Form UBAT; *ibid.*, Form Orange SUL/07/25 June 1944; Hugh Halliday, "The Norwegian Connection in Hornell Rescue," DHist Biographical File, "Hornell, D.E."; Larry Milberry and Hugh A. Halliday, The Royal Canadian Air Force at War, 1939-1945, (Toronto: CANAV Books, 1990), 348. The ASR Warwicks are referred to as Wellingtons in the Forms Orange. Wellingtons never carried airborne lifeboats, but the designs were similar; the Warwick had been intended as a replacement for the Wellington.

the dinghy and climb aboard once again. All except Scott were now in the dinghy, and he was hanging on to the sides, partially in and partially out of the water.⁷⁹

In the meantime Lt. Kraaft, the pilot of the Catalina orbiting overhead, became concerned that the rescuers might lose contact with the survivors in the dinghy, so the aircraft's dinghy radio was wrapped in a life preserver and dropped to them. Unfortunately, it landed some fifty yards away and the weary crew did not notice it. At 1030 the third Warwick dispatched to the downed Canadians made contact with the Catalina overhead. Radio and radar problems, coupled with poor visibility, had prevented the first two aircraft from reaching the scene. About ten minutes later, M/281 dropped the lifeboat to the survivors in the water, but it landed downwind and the parachutes failed to release, causing the boat to drift away. Hornell wanted to swim to the lifeboat, even though it was at least 500 or 600 yards away in heavy seas and his condition was worsening, but the remainder of the crew would not let him make the attempt. Shortly afterwards, St. Laurent succumbed to exhaustion and hypothermia and his body was let go, making room for Scott to crawl into the dinghy. At about this time, Catalina D/333 Squadron was forced to return to base, since it had left Sullom Voe in the Shetlands at 0930 on 24 June. Towards the end of its vigil over the Canadians, the crew of the Catalina noticed that no bodies were left in the oil patch where the U-boat had gone down. By the time the Norwegians returned to base, they had been airborne for almost thirty hours.⁸⁰

The survivors in the dinghy now had no contact with anyone, and no idea of when help would arrive. Bodnoff and Scott were weakening, and at about 1415 Scott died and the crew had to let his body go. Bodnoff began to revive, and Matheson, Hornell, and Campbell began to weaken. Denomy, Cole, and Bodnoff were in better condition, and

⁷⁹ 162 (BR) ORB, July 1944, Form UBAT; Halliday, "The Norwegian Connection in Hornell Rescue,"; Milberry and Halliday, The RCAF at War, 348.

⁸⁰ *ibid.*; 162 (BR) ORB, July 1944, Form UBAT; *ibid.*, Form Orange SUL/07/25 June 1944. The visibility was extremely poor. One source gives the ceiling as fifty feet. In fairness, it should be pointed out that 281 Squadron was also occupied with the search for a Fleet Air Arm aircraft at this time. Daniels, Rescue From the Skies, 51; Milberry and Halliday, The RCAF at War, 348.

Cole attempted to bale water out of the raft with an airman's cap but gave it up as useless, subsequently rigging the cap as a sea anchor. In the meantime, HSL 2507 had reached the area where the dinghy had been reported and was searching for the survivors. A Liberator that was presumed to be orbiting the scene could not be raised on the radio, and conditions made a visual search by the HSL an extremely difficult proposition. At 1341, Sunderland W/330, another Norwegian aircraft, sighted the launch and after finding out that the Canadians had not been rescued, began to search for them. Just over an hour later the survivors were located, and the aircraft dropped a smoke float to mark their position. By 1415 hours the HSL had reached the survivors, who had been in the water almost twenty-one hours. By this time, the three stronger crew members were trying to revive the three who were weakening. Cole managed to climb aboard by himself, while Denomy remained in the dinghy to help the launch's crew haul Bodnoff, Matheson, Hornell, and Campbell aboard, then followed them aboard under his own power. Despite the efforts of the HSL's crew, it proved impossible to revive Hornell, who died some twenty minutes after being taken on board.⁸¹

The attack on 24 June had sunk *U-1225*, a type IXC/40 submarine. Commanded by Oberleutnant Ernst Sauerberg, the submarine had been on its first patrol, leaving Kiel on 17 June. For his heroism in this attack and his fortitude and encouragement afterwards, Flight Lieutenant David Ernest Hornell was posthumously awarded the Victoria Cross, the first such award to a member of the RCAF, and one of only two awarded during the Second World War. F/O Denomy received the Distinguished Service Order, Campbell and Matheson received the Distinguished Flying Cross, and Bodnoff and Cole were awarded the Distinguished Flying Medal. Scott and St. Laurent were awarded Mentions in Dispatches, the only decoration other than the Victoria Cross that was could be awarded posthumously. Lieutenant Kraaft, the pilot of the Norwegian Catalina, was awarded the

⁸¹ *ibid.*; 162 (BR) ORB, July 1944, Form UBAT.

Distinguished Flying Cross for his role in the rescue as well as in the sinking of *U-423* on 17 June, and F/O William Garrett, the captain of HSL 2507, received an MBE for the part he played.⁸²

While what was undoubtedly 162 (BR)'s most famous action is most often remembered for the story of courage and fortitude involved in the rescue, the attack is also worth examining. This was the fourth U-boat sunk by the squadron in June, and was another schnorkel-fitted boat encountered on the surface. Once again, the squadron's training programme and the training offered by Coastal Command paid off, since Hornell and most of his crew had taken the anti-submarine course at Maydown in Northern Ireland, where they had managed to achieve complete surprise against the experienced submariners on the "tame" submarine used in training exercises.⁸³ The presence of yet another schnorkel-equipped boat on the surface can perhaps be more satisfactorily explained in this case than in others. The submarine was on a heading of 40°, which would take it towards Trondheim, not the Atlantic. Unless this course was only temporary, it would be reasonable to assume that *U-1225* was suffering problems with its schnorkel, especially since it was on its first patrol, and was putting in to Trondheim for repairs. There were a number of ports along the Norwegian coast where repairs could be carried out, but in the face of heavy Allied air activity, Trondheim would be the best choice for a boat forced to proceed part of the way on the surface. The course for Trondheim would take the submarine further away from Allied air bases, while putting in to ports such as Bergen and

⁸² Franks, Search Find and Kill, 50; Halliday, "Honours and Awards: No. 162 (BR) Squadron"; Milberry and Halliday, The RCAF at War, 348; Halliday, "The Norwegian Connection in Hornell Rescue". The other VC was awarded to P/O Andrew Mynarski of 419 Squadron. Although the action for which he was awarded the medal occurred on the night of 12/13 June, authorities were unaware of his actions until later. See Brereton Greenhous, Stephen J. Harris, William C. Johnston, and William G.P. Rawling, The Crucible of War: The Official History of the Royal Canadian Air Force, Volume III, (Toronto: University of Toronto Press, 1994), 809.

⁸³ 162(BR) ORB, 3 May 1944; "Interview by Roger Sarty with S.E. Matheson," 14 June 1993, 2, DHist Biographical File.

Stavanger would reduce the distance from such bases and increase the chances of being spotted and attacked by aircraft (see Map 4).

In the face of heavy losses from air attack, Group *Mitte* was reorganized on 24 June. The loss of two submarines in the reconnaissance line and the forced return of another to port, as well as the diminishing threat of an Allied landing in Norway, led the Chief of Naval Staff to order that only six U-boats should remain at sea in positions lying between 57° and 61° North, while the remainder of the boats were to return to Bergen or Stavanger. Group *Mitte* was also reduced to twenty-five submarines in order to free up crews for the Type XXI U-boats that had only recently begun to emerge from German shipyards. Eight of the boats returning to their Norwegian bases were to be paid off and their crews reassigned to training flotillas to man the new Type XXI U-boats. On 27 June, Group *Mitte* was further reduced by the transfer of five U-boats to the Baltic for operations against Soviet coastal traffic.⁸⁴ The heavy losses inflicted on Group *Mitte* and on the outward-bound U-boats, and the subsequent standing down of the *Mitte* boats, demonstrated the effectiveness of the air patrols in the Northern Transit Area and kept Norwegian-based U-boats from interfering with the Normandy landings.

Meanwhile, 162 continued its work in the waters north of Britain. On 25 June, three Cansos were flying patrols in the NTA. One of them, 9755, experienced unusually good visibility, sighting the Norwegian coast clearly from its second patrol area, while 9808 apparently took photographs of the oil slick that remained where *U-1225* had been sunk. Two more aircraft, 9769 and 9841, were en route from Reykjavik to Wick, landing on the 26th. The latter sighted some friendly fishing vessels but nothing else of importance. Two attacks were made on U-boats in the Northern Transit Area on 26 June;

⁸⁴ BdU war diary, IX, 392; J.P. Mallmann Showell, U-boats Under the Swastika: An Introduction to German Submarines, 1935-1945, (London: Ian Allan, 1974), 81; Hessler, U-boat War in the Atlantic, III, 69; Air Ministry, "The RAF in Maritime War," V, 19. The eight U-boats to be paid off were *U-1007*, *U-999*, *U-982*, *U-677*, *U-276*, *U-397*, *U-975*, and *U-1192*. None of the six submarines remaining on patrol were equipped with schnorkel.

Liberator N/86 sank *U-317*, one of the six boats remaining in the patrol line off Norway following the reorganization of Group *Mitte*. Liberator M/86 attacked *U-771*, another boat in the patrol line, but was shot down and failed to damage its target.⁸⁵ One Canso, 9841, was on patrol in the Northern Transit Area, and sighted an oil slick, a dinghy and three survivors, and remained over them to home in an ASR Warwick. Another dinghy was also sighted during the patrol, but it contained no survivors. Bad weather at Wick forced 9841 to divert to Stornoway.⁸⁶ Canso 9777 carried out a transit patrol from Wick to Reykjavik on the 26th, and 9766 returned to Iceland the same day, making a nonstop flight from Goose Bay to Reykjavik. Weather, however, forced 9779 and 9767 to abort their flights to Goose Bay from Reykjavik, both landing on the 27th. Weather once again interfered with squadron operations on 27 June, when Canso 9755 was recalled to Wick shortly after it entered its patrol area, and worsening weather forced its diversion to Stornoway.⁸⁷

The squadron's operations also underwent a significant change on 27 June. From that day onward all operational flights were to be flown from Wick. The ORB noted that the change made Reykjavik

merely a repair and rest base. A crew takes an aircraft to Wick, flies 50 hours, returning at the end to this base where the crew have a few days (2 to 4) to rest up, do laundry and carry out certain training, the aircraft is given a minor check (usually taking 8-10 hours) returning immediately to Wick, with a new crew. Our maintenance personnel are highly organized so that no matter what hour of the day or night an aircraft lands, for minor inspection, acceptance check, or whatever, there is absolutely no delay in starting the check. Every man knows his job and as a result a minor check seldom takes over ten hours.⁸⁸

⁸⁵ 162 (BR) ORB, 24-25 June 1944; "162 (RCAF) Squadron Operations with 18 Group from Wick," 18, 5; Air Ministry, "The RAF in Maritime War," V, 18; "A Kill on the Second Run," Coastal Command Review, 3:7 (July 1944), 5; BdU war diary, IX, 392, 399.

⁸⁶ 162 (BR) ORB, 26 June 1944. Unfortunately, the positions given in the ORB are encoded, so the actual position cannot be determined, and the identity of the three survivors and the outcome of the rescue are not recorded. Furthermore, Daniels does not mention this incident in Rescue from the Skies. It is possible that the survivors were from the downed Liberator.

⁸⁷ "162 (RCAF) Squadron Operations with 18 Group from Wick," 5, 18; 162 (BR) ORB, 24-27 June 1944.

⁸⁸ *ibid.*, summary for Reykjavik, June 1944.

From the available sources, it is not entirely clear why this change came about, although there are a number of possible reasons. The first is that by 27 June 162 (BR) had lost three aircraft to enemy action, and in order to maintain the detachment in Wick at its previous strength, operations from Reykjavik had to be abandoned. Second, the reinforcement of 18 Group that resulted from this switch may have been in response to concerns about renewed U-boat operations from Norway, especially since it was expected that a forthcoming American offensive would isolate the bases at Brest and Lorient (see Map 4) and thus leave Norway as the major base of U-boat operations. If the French bases did fall, furthermore, an exodus of submarines could be expected, heading for the Atlantic or for Norway. Finally, plans were underway to restart the Arctic convoys to the Soviet Union, and anti-submarine aircraft would be essential for the support of the convoys.⁸⁹

The heavy U-boat losses recently suffered in the Northern Transit Area led BdU to order once again on 27 June that submarines passing through the area proceed mainly submerged, using schnorkel as far as possible, until they reached an area to the west of the British Isles and south of Iceland. The following day, *U-423* and *U-243*, which BdU believed were to the west of the British Isles, received orders to proceed towards the Channel with care and not at maximum speed as had previously been ordered. On 30 June, BdU placed even more restrictions on boats passing through the area. Outward bound boats were ordered to return to base if their schnorkel was unserviceable unless they were already west of 10° West, in which case they were to report the condition of the schnorkel and make for the west coast of France. U-boats were again ordered to use their schnorkel in the transit area, since the boats' anti-aircraft defences were "inadequate against strengthened forces of Mosquito aircraft."⁹⁰ These aircraft appear to have exerted an

⁸⁹ Roskill, *The War at Sea*, III, pt. 2, 128; 155-158.

⁹⁰ Air Ministry, "The RAF in Maritime War," V, 19; BdU war diary, 27-28, 30 June 1944, IX, 401, 402, 407-408. BdU was not yet aware of the loss of *U-423* to 333 Squadron on 17 June, although it did acknowledge it on the 30th. Tarrant, *The Last Year of the Kriegsmarine*, 237; BdU war diary, 30 June 1944, IX, 408.

influence on the German command out of proportion to their numbers; on 5 June, the flight of 333 Squadron that operated the only Mosquitoes in 18 Group had seven of them, of which five were available for operations. Their role had initially been fleet reconnaissance, although they had also provided escorts for anti-submarine aircraft operating off the Norwegian coast in case of attack by German aircraft. From 14 June onwards, however, they were increasingly used for A/S work. The propensity of Mosquito attacks to damage but not sink U-boats probably led to BdU's distorted concerns. The submarines returning to port due to damage had frequently been attacked by Mosquitoes and made reports to that effect, but there were also many that did not return and could not report the reasons for their loss. BdU assumed that Mosquitoes were also responsible for these sinkings, when in fact they were largely due to attacks by heavier aircraft. The high speed and heavy cannon armament of the Mosquito must also have played a part in the overestimation of their threat to U-boats; the majority of the attacks made by them seem to have inflicted heavy casualties on the submarines' bridge crews but limited damage to the submarines themselves.⁹¹

Meanwhile, on 28 June, two attacks were made in the Northern Transit Area. Catalina C/333 sighted a schnorkelling *U-478* only 100 yards away, but the resulting steep turn and snap attack failed to inflict any damage on the Channel-bound boat. Catalina Q/210 sighted *U-396* on the surface, but vigorous flak and evasive manoeuvres by the submarine resulted in only limited damage being inflicted. Since *U-396* was headed for the Channel, where overwhelming opposition required peak performance, the boat returned to

⁹¹ BdU's concern about the threat posed by Mosquitoes is apparent in several entries in its war diary made around this time. See the entries for 21 June, 30 June, 15 July, and Serial Order No. 14, July 1944 issue, for examples. BdU war diary, 21, 30 June, 15 July 1944, "Serial Order No. 14, July 1944 Issue," IX, 381, 407-408, 451, 452; Air Ministry, "The RAF in Maritime War," V, Appendix I, "Coastal Command Order of Battle, Strength, and Availability, 5th June 1944," 2; *ibid.*, 18. As mentioned above, BdU had already assigned a major role in the sinkings of *U-477*, *U-675*, and *U-292* to Mosquitoes, when in fact a *Canso*, a *Sunderland*, and a *Liberator* respectively had been responsible. BdU war diary, 21 June 1944, IX, 381; Tarrant, The Last Year of the Kriegsmarine, 236.

Bergen for repairs. Three of 162's aircraft were flying patrols in the waters north of Scotland on 28 June, but nothing was sighted, although 9755 was homed on to a Sunderland and carried out a search in the other's patrol area after it had left. Three more Cansos flew transit reconnaissances, 9841 and 9796 from Wick to Reykjavik, and 9777 from Reykjavik to Wick. The following day, only two aircraft made operational flights; 9769 carried out an anti-submarine sweep, and 9841 returned to Wick after an inspection and test flight in Reykjavik. Two sightings were made of *U-396*'s periscope in the Northern Transit Area on the 29th, resulting in one attack that inflicted no damage.⁹²

On 30 June, four of 162 (BR)'s aircraft were on transit flights, three from Wick to Reykjavik, and one in the opposite direction, while one was on patrol in the Northern Transit Area. Canso 9841, with F/L R.E. MacBride and crew, was on patrol in Area Blue Jig West, when at 1750 hours in position 63° 20' N, 00° 10' E, a schnorkel and periscope were sighted 40° to port and one mile away from the aircraft, proceeding at about four knots. Flying at 3,000 feet, the aircraft was unable to lose height and attack before the U-boat completely submerged.⁹³ At this point, MacBride began a homing procedure, and two Liberators and a Sunderland arrived in short order. The Sunderland was forced to leave shortly afterwards, as it had reached its prudent limit of endurance, but MacBride established a series of concentric expanding box patrols around the datum of the sighting.

⁹² Air Ministry, "The RAF in Maritime War," V, 18; "162 (RCAF) Squadron Operations with 18 Group from Wick," 6, 18; 162 (BR) ORB, 29 June 1944. There is some confusion about the date and time of the return flight of 9841 in the operational narrative, which is compounded by the flight's absence from the flying records in the squadron ORB. *ibid.*, 29 June 1944; Air Ministry, "The RAF in Maritime War," V, 18.

⁹³ "162 (RCAF) Squadron Operations with 18 Group from Wick," 6, 15-16; 162 (BR) ORB, 30 June 1944; USIGHT Report, PRO AIR 15/141. The crew consisted of F/L R.E. MacBride, captain, F/O J.K. Guttormson, co-captain, F/O W.C. Lawrence, navigator, P/O G.P. McNulty, 1st WAG, P/O D.G. MacDonald, 2nd WAG, F/S G.W. Kine, 3rd WAG, Sgt. C.G. White, 1st engineer, Sgt. T.C. Harper, 2nd engineer. It is interesting to note that operational research work during the war discounted Coastal Command concerns that Catalinas would have difficulty losing altitude quickly enough to attack when a sighting was made from a patrol altitude of over 2,000 feet, but it should be pointed out that this sighting was only a schnorkel and periscope, not a surfaced U-boat, and was made at very short range. C.H. Waddington, *O.R. in World War 2: Operational Research against the U-boat*, (London: Elek Science, 1973), 163.

The Canso carried out the inner patrol, ABLE, while the Liberators were assigned the BAKER and CHARLIE patrols at greater distances from the centre.⁹⁴

Three hours later, in position 63° 28' N, 00° 42' W, flying at 1,000 feet, MacBride spotted a fully surfaced U-boat eighteen miles away and 20° to port of the aircraft. The "brownish black" submarine, heading 340° at ten knots, opened fire with heavy flak when the aircraft was four miles away. The Canso took violent evasive action, and the front guns opened fire at 1,200 yards, scoring hits on the conning tower. At 500 yards, the U-boat opened accurate machine gun fire on the attacking aircraft, and at a distance of 2 or 300 yards scored hits on the Canso's port wing and aileron. The aircraft passed over the U-boat at an angle of 45° from starboard towards its bow, but the depth charges failed to release. The starboard gunner fired 400 rounds at the submarine after the Canso passed overhead, and the boat resumed its anti-aircraft fire. After reaching an altitude of 1,000 feet, the Canso began to circle the U-boat amid intermittent flak. Deciding not to risk the lives of his crew by making another attack with depth charges that would not release, MacBride homed in one of the Liberators in the vicinity. At 2115, Liberator E/86 arrived and sighted the U-boat eight miles away in position 63° 27' N, 00° 50' W. Diving to attack, the Liberator took evasive action by undulating when the U-boat opened fire. At 700 yards, the front gunner in the Liberator returned fire, and the Liberator straddled the submarine with six depth charges, lifting the U-boat's bow out of the water, after which the boat sank stern first. The Liberator had also been hit by flak during the attack, suffering damage to the Number 4 engine. Approximately twenty survivors clustered around two dinghies were seen in the water, as was a growing patch of oil. Canso "A" 9841 returned to Wick early the following morning, landing at 0158 local time.⁹⁵

⁹⁴ "162 (RCAF) Squadron Operations with 18 Group from Wick," 15; "Interview by Roger Sarty with Ray Crone," 13 June 1993, DHist Biographical File. The pattern of patrols is somewhat conjectural, but agrees with available evidence.

⁹⁵ USIGHT Report, PRO AIR 15/141; "162 (RCAF) Squadron Operations with 18 Group from Wick," 16; Douglas, The Creation of a National Air Force, 594-595; Franks, Search Find and Kill, 51; "A Model Action," Coastal Command Review, 3:7 (July 1944), 5-6. The narrative of squadron

German listening stations had been following the radio messages surrounding the destruction of this U-boat; at 1750 MacBride's first submarine sighting report was intercepted. His homing signals that followed seem to have been misinterpreted as a report of a surfaced submarine in the same location, but the report of the second sighting was intercepted and accurately interpreted, as was the subsequent report of damage to the aircraft, although the records in the BdU war log incorrectly state that the aircraft reported that it was giving up the hunt. The Liberator's sighting report at 2120 was also intercepted, although subsequent messages are not recorded. One report was also received from the U-boat; at 2059 *U-478* reported an air attack in the same area as the aircraft reports, although BdU did not realize that the submarine had been sunk. On its first patrol, the schnorkel-equipped *U-478* had left Kiel on 20 June, under the command of Oberleutnant Rudolf Rademacher, and was bound for the English Channel. *Coastal Command Review* stated that this attack "showed excellent co-operation between the two aircraft, and perfect handling of the W/T, R/T and homing procedure."⁹⁶ The same submarine's periscope and schnorkel had been spotted three hours earlier by MacBride, and the hunt around this datum had led to its destruction. As a result of the effective co-operation between the Canso and the other aircraft, credit for the sinking of *U-478* was shared between 162 (BR) and 86 Squadron, RAF.⁹⁷

In this attack, the training and practice carried out by the squadron paid off once again. While the Canso was hit by flak, the violent evasive manoeuvres used by MacBride probably saved the aircraft from worse damage or being shot down. As mentioned in the

operations from Wick does not agree with the other sources in some details, especially the times of sightings and attacks. It also claims that no oil or wreckage was left on the surface after the U-boat was sunk. The crew of Liberator E/86 were F/O N.E.M. Smith, pilot, F/O G.F. Aspinall, 2nd pilot, F/L J.D. Symonds, 1st navigator, F/Sgt. E.A. Brown (Australia), 2nd navigator, Sgt. F. Chiltern, engineer, W/O J. Hamilton, AG, W/O A.A. Tulip, WOP/AG, Sgt. E.A. Horton, WOP/AG.

⁹⁶ BdU war diary, 30 June 1944, IX, 406; Franks, *Search Find and Kill*, 51; Air Ministry, "The RAF in Maritime War," V, 18; "162 (RCAF) Squadron Operations with 18 Group from Wick," 16.

⁹⁷ Air Ministry, "The RAF in Maritime War," V, 18-19; Douglas, *The Creation of a National Air Force*, 595. It is an interesting coincidence that MacBride and his crew contributed to the sinking of *U-478*; their attack of 3 June had sunk *U-477*.

discussion of the attack on 3 June that sank *U-477*, MacBride was a very experienced pilot, and he and his crew had had the benefit of Coastal Command's training course at Maydown in Northern Ireland. MacBride also had the presence of mind to realize that a second attack on *U-478* would be futile after the aircraft had been damaged and the depth charges had failed to drop. Risking the aircraft and crew again was unnecessary, since the U-boat remained on the surface and nearby aircraft could be homed in to carry out an attack with a greater chance of success. It was at this point that the extensive homing practice carried out by the squadron's aircraft paid off, when Liberator E/86 arrived and sank *U-478*.

This was actually the second time that such practice paid off; the first had been after the initial sighting when the two Liberators and the Sunderland had been homed in to sweep the area. The success of this procedure demonstrated the value of standardized doctrine; the aircraft had not operated together before, but were able to successfully carry out a search that resulted in the destruction of a U-boat. Had other aircraft not been in the immediate area, a second attack on *U-478* might not have been possible as soon as it was, and the boat might have decided to submerge. If it had, MacBride would have had no choice but to carry out an attack. Although it would not have been met by flak, later examination of the aircraft revealed that the depth charges would not have released and *U-478* might very well have escaped and continued on its course towards the English Channel and the Allied invasion forces, although its operations on the surface might well have resulted in its destruction later on by another aircraft operating in the Northern Transit Area. Once again, 162 (BR) had encountered a schnorkel-equipped U-boat on the surface, and like the other boats, overconfidence, inexperience, or technical difficulties experienced by the U-boat crews probably led to the boat's operating on the surface, although the first encounter with *U-478* was while it was schnorkelling, which suggests either that a fault of some sort had developed between the first and second sightings, or that the boat's commander believed the Canso had left and decided to proceed at high speed on the

surface. In either case, the search organized by MacBride sealed the U-boat's fate once it began operating on the surface. For their successful attack on *U-477* and role in sinking *U-478*, F/L R.E. MacBride, his co-pilot F/O J.K. Guttormson, and P/O G.P. McNulty, one of the crew's WAGs, received the Distinguished Flying Cross.⁹⁸

When Canso 9841 returned to Wick early on 1 July, examination by the ground crew discovered why the depth charges had not released during the attack. Two shells from the U-boat's flak armament had damaged one of the aircraft's outer wing panels, which now had to be replaced.⁹⁹ RAF engineers predicted a six week repair job. Unwilling to accept such a delay, the officer in charge of the groundcrew detachment, F/O Marsden, requested and received a Catalina outer wing panel from the RAF. By 18 July the damaged panel had been removed and the new panel was then installed in an all-out effort by the groundcrew, apparently with the assistance of some civilian personnel from Scottish Aviation Co. On 20 July, F/L MacBride and crew took the repaired Canso on a two-hour test flight and compass swing, and then took the aircraft out on patrol on the 22nd.¹⁰⁰ The limited number of RCAF groundcrew at Wick had managed to return the aircraft to service in half the time predicted by RAF personnel. While this incident demonstrated the initiative and skill of the squadron's groundcrew, it also indicated the potential problems of detached operations at Wick when many of the spares for Cansos were unavailable in the British Isles. Fortunately, the outer wing panels and many other components were interchangeable between the Canso and the Catalinas used by the RAF, but had repairs to 9841 required spares unique to the Canso and thus unavailable in the

⁹⁸ Halliday, "Honours and Awards: No. 162 (BR) Squadron". MacBride's citation states that his award was for the sinking of *U-477*, Guttormson's award was also for the attack on *U-478* and for later actions, and McNulty's was for his role in the two attacks and for homing in the Liberator to carry out its attack.

⁹⁹ The available documents do not explain whether it was this or other damage that severed the depth charge release circuits.

¹⁰⁰ Letter to the author from Ray Crone, 12 May 1996; 162 (BR) ORB, July 1944, Appendix F, "Maintenance Report"; *ibid.*, 1, 20, 22 July 1944.

British Isles, the detachment in Wick would have been hard pressed to carry out repairs in such short order.

While the focus of the squadron's operations was Wick and the Northern Transit Area, little could have been accomplished without the activities at Reykjavik. Until 27 June, operations on a limited scale were carried out from Iceland, and throughout June training flights and aircraft maintenance were carried out there, with the exception of the maintenance carried out by the small contingent of groundcrew at Wick. The beginning of June witnessed the alleviation of the motor transport situation for the squadron when three jeeps were obtained from the Americans via Lease Lend purchase. The squadron's transport section now consisted of two Cletracs (caterpillar tractors), two tractors, and three Jeeps, as well as two trucks made available from the station's transport section. Somewhat later in the month, the base acquired a more Canadian flavour when signs reading "RCAF - Camp Maple Leaf" were erected. The signs were the responsibility of S/L Davidson, the squadron chaplain, who was also the officer in charge of signs. In months to come, his duties would expand to cover other areas as well.¹⁰¹

By the middle of June, when the squadron's aircraft were heavily engaged in the battle against U-boats in the Northern Transit area, speed in servicing aircraft became necessary. On 12 June, F/L Hornell and crew flew Canso "A" 9808 from Wick to Reykjavik, and since it was expected that the aircraft would soon have to return to Wick, the groundcrew were asked to have it ready as soon as possible. The minor check was completed in five hours.¹⁰² Although the squadron's maintenance personnel were equal to the task of keeping the Cansos serviceable, the supply of parts from Canada was not. On 15 June, for example, an inspection of the maintenance section showed that Canso 9755, which had been sent in for a major check, was grounded for a want of parts. The most common deficiencies in spares appear to have been in small but essential parts, such as

¹⁰¹ *ibid.*, 1 June 1944; *ibid.*, June 1944, Appendix B, "Maintenance"; *ibid.*, 10 June 1944.

¹⁰² *ibid.*, 12 June 1944.

hose connections, washers, and cotter pins, but much of the time the squadron was fortunate in being able to obtain these parts from either the RAF or the Americans. The continuing absence of an air compressor nonetheless threatened the squadron's ability to maintain its aircraft. The Americans were still the only source of compressed air, and the squadron maintenance report noted that "nearly every night it has been necessary to get compressed air from the Americans, and as this entails rousing one of them out of bed to drive their Cletrac [caterpillar tractor] over to the 162 Squadron hangar, Squadron personnel are faced with the embarrassment of wearing out a welcome."¹⁰³ The lack of spares and continuing lack of an air compressor six months after the squadron's arrival in Iceland demonstrated the RCAF's inability to supply basic equipment to one of their Home War Establishment squadrons stationed outside of Canada. The delivery of transport versions of the Consolidated Liberator to the RCAF's heavy transport squadron, which would make regular supply flights possible, would not begin until late 1944.¹⁰⁴

The squadron was also experiencing difficulties with the return of aircraft from major inspections carried out in Canada. Not only were the crews on leave in Canada prevented from returning to Iceland by the slowness of the servicing at Scoudouc, but the lack of aircraft and aircrew, coupled with the squadron's losses to enemy action, limited the squadron's operational capabilities, even though the average serviceability of the remaining aircraft increased. The average number of aircraft in the squadron fell from fourteen in April to thirteen in May, and then to just under ten in June, while the serviceability rose from six of fourteen in April to nine of thirteen in May to just over eight of ten in June. Of these eight aircraft, an average of five were in Wick on any given day, although the transfer

¹⁰³ *ibid.*, June 1944, Appendix B, "Maintenance".

¹⁰⁴ The first of ten Liberators intended for transport service arrived in Canada in August 1944, but the necessary modifications meant that none entered service with 168 (HT) Squadron until October. The RCAF was supposed to receive eighteen transport versions of the Liberator (C-87) in mid-1944, but the Americans decided not to deliver the aircraft, and substituted regular production versions (B-24J) of the Liberator bomber, which required extensive alteration before they could serve as transports. Carl Vincent, Canada's Wings, Vol. 2: Consolidated Liberator and Boeing Fortress, (Stittsville, Canada's Wings, 1975), 135.

of all operational flights to Wick on 27 June meant that the numbers increased by the end of the month.¹⁰⁵ The small maintenance section in Wick did an excellent job of keeping the Cansos in the air. The return of Cansos to Reykjavik for minor inspections every fifty hours of flying time naturally reduced the need for an extensive supply of spares in Wick and meant that a large maintenance crew was not required, but in over 850 hours of operational flying from Wick in June, only two flights had to be cancelled as a result of technical failures, an excellent record. The replacement of the port outer wing panel on Canso 9841 with the assistance of personnel from Scottish Aviation Co. was perhaps their most impressive accomplishment, since the RAF had predicted that the repair would take several weeks at a depot but the task was accomplished in a thirty-six hour burst of activity using jury-rigged equipment.¹⁰⁶ The activities of the squadron's groundcrew were an essential component of the squadron's successes during June, and the high serviceability rates they maintained were certainly a far cry from the squadron's early days in Yarmouth.

By the end of June, 162 (BR) had made six attacks, which destroyed four U-boats and contributed to the destruction of a fifth. Three Cansos and thirteen aircrew had been lost to enemy action, while a fourth aircraft was temporarily grounded due to flak damage. Ten personnel from the downed aircraft had been rescued from the sea and another had become a prisoner of war.¹⁰⁷ The squadron's analysis of the month's activities concluded that

Our own losses in this period might be said to be due to the fortunes of war, but in our opinion are directly the result of poor, inadequate and insufficient armament. Specifically referring to our nose gun installation. This matter has been referred to E.A.C. H.Q. and it is hoped that immediate action will be taken. Briefly, what we require is a power operated, quadruple gun (.5" or .303") nose turret and this is not considered unreasonable or beyond the realms of capabilities [sic].

¹⁰⁵ *ibid.*, summary for June 1944; *ibid.*, June 1944, Appendix B, "Maintenance"; *ibid.*, May 1944, Appendix B, "Squadron Maintenance Report, April - May 1944".

¹⁰⁶ *ibid.*, June 1944, Appendix B, "Maintenance"; *ibid.*, July 1944, Appendix F, "Maintenance Report"; "Interview by Roger Sarty with Ray Crone," 13 June 1993, 7.

¹⁰⁷ Sergeant J.E. Roberts was apparently the only member of EAC to become a prisoner of war during World War II.

U/B [U-boat] Warfare has arrived at the point where aircraft must be heavily armed. With good aircraft armament, the U/B hasn't a chance, with poor aircraft armament, we haven't a chance.¹⁰⁸

This is a reasonable assertion. The weakness of the Canso's front mounted armament was probably a major contributing factor to the loss of Canso 9754 on 24 June, and an argument could be made that a more powerful armament on 9816 would have eliminated the entire bridge crew on *U-715* and thus prevented the aircraft's loss. The role of the front mounted machine guns in the loss of Canso 9842 on 13 June remains unknown, although it would have been a reasonable assumption that problems with the armament contributed to the aircraft's loss.¹⁰⁹

The drawbacks of the standard twin-gun installation have already been discussed.¹¹⁰ Foremost among them was the tendency for the ammunition feed chutes to kink and cause jams in the ammunition feed, a problem which may have caused the jam during Hornell's attack on *U-1225* on 24 June. Unfortunately, the available records do not reveal if the installation in Canso 9754 or any of the squadron's other aircraft was modified according to the squadron's plans. The issue is further confused by the armament report for July 1944, which reports that "recent" tests on the squadron's machine guns "revealed that [the] guns were in very poor condition and replacements were necessary."¹¹¹ These tests, which took place on 21 July, were part of the reorganization of the squadron's gunnery in co-operation with the Station Armament Officer, and concluded that "maintenance and service must be much more strict."¹¹² This was not the first time that problems had been revealed in the armament section; on 24 April three of its members had been disciplined for failing to carry out their daily inspections.¹¹³ The possibility does

¹⁰⁸ *ibid.*, June 1944, Appendix A, "Summary 'U/B Attacks' June".

¹⁰⁹ The sole survivor's account of the loss of Canso 9842 is not available to the general public.

¹¹⁰ See 162 (BR) ORB, March 1944, Appendix F, "Ammunition Tank Modification for Twin Nose Guns on Canso 'A' and Catalina Type Aircraft", as well as the discussion of the subject in Chapter 5.

¹¹¹ *ibid.*, July 1944, Appendix A, "Armament Report".

¹¹² *ibid.*, 6, 21 July 1944.

¹¹³ *ibid.*, 24 April 1944.

exist, therefore, that the poor condition of the squadron's weapons could have contributed to the armament problems, but it should be remembered that had the condition of the weapons been poor enough to cause frequent faults, more mention of the subject would probably have been made in the ORB and in other records.

Although the assertion that the squadron's losses in June were due to armament problems is fairly sound, 162 (BR)'s loss rate was not exceptional. The most obvious comparison is with the figures for the other squadrons in the Northern Transit Area for April through August 1944 (see Appendices D and E). If 162 (BR)'s activities are not included, fourteen U-boats were sunk for the loss of ten aircraft, while if the squadron's operations are included, eighteen U-boats were sunk for the loss of thirteen aircraft. In both cases, the loss rate is slightly over 0.7 aircraft lost per U-boat sunk. The three Cansos lost in return for the sinking of four U-boats in June give a loss rate only slightly higher, at 0.75 aircraft lost per U-boat sunk. In comparison, the various Bay of Biscay offensives from January 1941 to May of 1944 lost an average of seven aircraft for each U-boat sunk, although the loss rates varied over time from a high of sixteen to a low of two aircraft lost per aircraft sunk, and U-boats were not always following a policy of fighting back on the surface.¹¹⁴

While the squadron's loss rate was therefore not unusual for aircraft operating against U-boats fighting back on the surface, a number of factors combined to emphasize the losses that were suffered. The first was their close proximity to each other; within less

¹¹⁴ Roskill, The War at Sea, III, pt. 1, 263, Table 15. A very detached and dispassionate examination suggests that the loss of a large anti-submarine aircraft and its crew in return for the sinking of a U-boat was advantageous for the Allies, both in terms of relative material losses and in terms of casualties inflicted.

It is worth pointing out that in the case of attacks made by 162 (BR), the U-boats' flak armament was only truly effective in one instance, when *U-480* managed to avoid destruction on 13 June. The purpose of the flak armament was to deter aircraft from attacking, or to disturb the accuracy of the attack, or even to destroy the aircraft before it could release its depth charges or use other weapons. Forcing the attacking aircraft to ditch after making its attack was of little avail to the submarine if the attack was delivered and it was sunk. The purpose of the anti-aircraft armament, after all, was to protect the U-boat and not necessarily to destroy attacking aircraft.

than two weeks, three aircraft were lost to enemy action, and two were lost on 13 June. The second was that 162 (BR) had not previously lost an aircraft to enemy action, which must have amplified the effect of these losses. Third, the four attacks that sank three U-boats without loss to the squadron prior to 13 June also played a role. The sudden spate of losses would have had a greater impact than if they had occurred during the squadron's first attacks; it must have seemed that machine gun fire and evasive action had mastered the flak thrown up by the submarines. These comparisons do not in any way diminish the severity of the squadron's losses or their impact on its personnel. The subsequent demands for heavier armament to deal with surfaced U-boats were reasonable given the losses that were suffered and the probable reasons for the losses. The armament of some of the squadron's Cansos was in fact improved following the events of June 1944, and these modifications will be discussed below. For the time being, however, 162 (BR) had to face the enemy with equipment that seemed inadequate to the task.

Even with its seemingly inadequate equipment, the squadron had made a substantial contribution to Coastal Command's northern operations in support of the Normandy landings. Of the eight U-boats sunk in the Northern Transit Area in June of 1944, 162 (BR)'s Cansos sank four and played an essential role in the sinking of a fifth. The squadron's aircraft losses during the month, however, were correspondingly high; half of the six aircraft lost to enemy action were Cansos. In addition to the straightforward advantages of helping to destroy the enemy's forces, the squadron's victories helped protect the Normandy landings against the U-boat threat. Two of the submarines destroyed by 162's aircraft - *U-477* and *U-715* - as well as *U-478*, whose sinking was the result of a shared effort by 162 and 86 Squadrons, had received orders to head for the English Channel and the invasion beaches. Although all three might not have reached the Channel had they not been sunk, the experience of *U-984* gives some idea of the consequences of one boat reaching the invasion area. In the last week of June, this U-boat torpedoed four Liberty ships, one of which was saved while the other three became total losses after being

beached. As Roskill states in the British official history, “such results accomplished by a single enemy showed very clearly what might have happened had any significant proportion of the U-boats ordered into the Channel managed to reach the waters through which such dense traffic was passing at the time.”¹¹⁵ Fortunately for the Allied landings, few U-boats managed to pass through the anti-submarine forces protecting the landings, of which the aircraft of 18 Group operating in the Northern Transit Area were a part.

The end of June marked the end of 162’s intense encounters with the enemy in the Northern Transit Area. Although other sightings and attacks would take place, never again would so many U-boats be met and defeated by the squadron. The operations of 162 (BR) during June of 1944 demonstrated what an Eastern Air Command squadron could accomplish when given the opportunity to encounter the enemy in more favourable circumstances than the waters off the Canadian coast. Constant training and the benefit of others’ experience, coupled with the courage of the aircrew and the efforts of the groundcrew bore fruit during those four weeks. The squadron’s ORB accurately summed up its activities in June, and the reasons for their success:

June from the beginning to the end has been the most noteworthy month in the history of this squadron. Other months we have done more flying, more training, more organizing and have undergone more hardships, but it was such months which made possible this month of June.¹¹⁶

¹¹⁵ Air Ministry, “The RAF in Maritime War,” V, 19, n. 1; BdU diary, IX, 381, 399; Air Ministry, “The RAF in Maritime War,” V, 18; Roskill, The War at Sea, III, pt. 2, 67-68.

¹¹⁶ 162 (BR) ORB, summary for June 1944.

Chapter 7

The Inshore Campaign Begins: July-December 1944

Now that the French Atlantic ports are no longer in our possession, U-boat operations will be continued from Norway. A few Home ports will also be used, since the Norwegian bases have insufficient accommodation, and operational possibilities will thus be limited. . . . As a rule we shall be unable to use the Type VIIC boats in the Channel . . . the only other areas remaining to them are the Moray Firth, the Minch and the North Channel in British coastal waters, and Reykjavik.

Flag Officer U-boats, 15 September 1944¹

As 162 (BR) entered the month of July 1944 it could boast of an impressive record against the U-boats in the Northern Transit Area. During June, its Cansos had destroyed four U-boats and shared in the destruction of another, albeit for the loss of three aircraft and fourteen crew, one of whom became a prisoner of war. One of its pilots, Flight Lieutenant D.E. Hornell, was posthumously awarded the Victoria Cross for his role in the sinking of *U-1225*. The activities of 162 (BR) and other squadrons in the Northern Transit Area in June 1944 helped support the Allied landings in Normandy. Several U-boats bound for the English Channel and the invasion fleet fell victim to air patrols, and submarines sent to other locations to draw Allied anti-submarine forces away from the landing beaches were suppressed. Eight U-boats had been sunk and four damaged in the waters to the north of the British Isles, and to a casual observer it might have appeared that the German submarine threat had been overcome. This was not the case. By September a new U-boat offensive had begun, and this time the Allies were unable to score a decisive victory. Only the end of the war in Europe stopped the inshore submarine offensive.

For several reasons, the conditions that had led to Coastal Command's successes against U-boats in the Northern Transit Area in June disappeared early in July. With no U-boats in the waters to the west and southwest of Norway, no sightings were made until 13 July, despite heavy air patrols (see Appendix E). In the first week of the month, there was

¹ Quoted in Günter Hessler, The U-Boat War in the Atlantic, 1939-1945, Volume III: June 1943-May 1945, (London: HMSO, 1989), 83.

only one outward bound submarine, *U-855*, to the north of the British Isles, and it passed through undetected, helped by the poor weather in the transit area. Between 1 and 4 July, all of 162's aircraft in Wick were grounded by fog, and Canso "A" 9769's flight to Reykjavik on the 5th was the only operational sortie flown by 18 Group on that day apart from four meteorological flights, which suggests that the other 18 Group bases had also been affected by the weather.²

The offensive in the Northern Transit Area in June had claimed submarines from Group *Mitte*'s patrol line off the Norwegian coast as well as boats on their way to the Atlantic. Many of the surviving boats were now recalled to base as a result of the heavy Allied air activity and correspondingly heavy German losses throughout June and the offshore patrol line was reduced to five U-boats which surfaced only rarely. In addition to *U-855* and the offshore patrol line only one other submarine, *U-247*, was at sea in the Northern Transit Area and it had been on patrol in the North Minch area (see Map 5) since the middle of June. On 5 July the boat signalled that it had encountered little traffic, and four days later it received orders to proceed to the Brest area, making *U-247* the last Norwegian-based U-boat to be sent to the Channel for many months.³

The mandatory use of schnorkel when proceeding through the Northern Transit Area also contributed to the sudden decrease in sightings by air patrols. Although many of the boats sunk in June were schnorkel-equipped, they had been encountered on the surface, either due to their commanders' impatience or because of problems with the schnorkel. The latter might have been caused either by inexperience, overconfidence, or actual defects

² "162 (RCAF) Squadron Operations with 18 Group from Wick," unpublished narrative [1945], 6, DHist 74/1. The flying records in the squadron ORB do not completely agree with the narrative of operations from Wick about 9769's flight on 5 July, and similar discrepancies exist elsewhere in these records. The dates, times, and aircraft movements described in this chapter are the most probable actions based on available records. Any large or important discrepancies will be noted.

³ *U-855* was a type IX assigned to overseas operations. Another type IX U-boat, *U-865*, also bound for overseas operations, was forced to turn back due to schnorkel defects. Great Britain, Air Ministry, Air Historical Branch, "The RAF in Maritime War, V: The Atlantic and Home Waters - The Victorious Phase, June 1944 to May 1945," 53-54, DHist 79/599.

with the equipment.⁴ For several reasons these factors probably became less important in July. First, the Allied bridgehead in Normandy had been established, and the high losses suffered during the initial reactions to the landings had led BdU to reconsider its orders. By late June, U-boats were ordered to proceed towards the landing areas with care and not at maximum speed as previously ordered. In July, boats leaving Norwegian and German ports for the Atlantic, which therefore had to pass through the Northern Transit Area, received orders stating that

it does not matter if boats arrive several days late in their operations area. The commanding officer's most important job is to get his boat safely through this dangerous area, where we have suffered heavy losses during the last weeks.⁵

These orders were a sharp contrast with BdU's early reaction to the landings, when, Hessler records, "in this hour of crisis the role of the U-boats was decisive to the outcome of the war and every available boat had to be flung into the battle, regardless of cost."⁶ In the early days of the Normandy landings, the tenuous nature of the Allied beachhead meant that the potential benefits of a U-boat attack on invasion shipping outweighed any risks taken in making attacks. By 10 June, however, the heavy losses of non-schnorkel boats in the face of Coastal Command's "Cork" patrols and other Allied anti-submarine forces led to their recall, but the two remaining boats had already been lost to air attack. BdU now realized that only schnorkel boats could make the passage to the invasion area and stand any chance of survival, and that even in renewed Atlantic convoy battles, where the Allies would not be able to concentrate A/S forces as they had in the English Channel and its southern approaches, heavy losses could be expected amongst non-schnorkel boats. The

⁴ Air Ministry, "The RAF in Maritime War," V, 17, n.5. *U-715*, sunk by 162 (BR) on 13 June, was detected because of incorrect depthkeeping that exposed too much of its periscope and schnorkel when it was rising to schnorkel. For the German crew's perspective on this problem, see "The End of 'U 715'," *Coastal Command Review*, 3:7 (July 1944), 8, DHist 181.003 (D963).

⁵ BdU war diary, 28 June 1944, "Serial Order No. 14, July 1944 Issue," IX, 402, X, 452-453 DHist 79/446. No precise date is given for the latter order, but it is found following the diary entry for 15 July, so it was almost certainly issued in the first half of the month.

⁶ Hessler, *The U-Boat War in the Atlantic*, III, 67.

non-schnorkel boats remaining in Biscay ports were being equipped with schnorkel with the "utmost vigour."⁷

Since the emphasis was now on safe arrival rather than the earliest possible arrival regardless of risk in the invasion area, U-boat commanders were far more likely to proceed entirely submerged on schnorkel and battery power rather than running at high speed on the surface. Inexperience and defects were undoubtedly remedied as increasing experience was gained with the schnorkel, and as it became apparent that the Normandy landings were the main Allied effort and not a diversion, more time could be given to training boats and their crews in the use of the schnorkel.⁸

The reduction of U-boats in the Northern Transit Area decreased the possibility of sightings and attacks for all of the squadrons operating north of Scotland, but 162 (BR) was further handicapped by its operational losses. Three Cansos were lost to enemy fire in June, and a fourth was grounded in Wick awaiting major repairs. Three crews were also no longer able to carry out operations; all of Sherman's crew had been lost, with the exception of one crew member taken prisoner, while Chapman's and Hornell's crews had both lost members while awaiting rescue. The rebuilding of the squadron's strength began on 1 July, when Canso "A" 11065, a new addition to the squadron, flew the first leg of the trip from Canada to Iceland. It arrived in Reykjavik on 8 July, carrying a new crew headed by F/L Pilling. Three other Cansos arrived on the 5th; 9759, 9812, and 11039 all returned

⁷ Hessler, The U-Boat War in the Atlantic, III, 68-69; "Appendix to diary of 24.6.1944," BdU war diary, IX, 394-395. BdU acknowledged in this appendix that even though losses among non-schnorkel boats in a renewed campaign against Atlantic convoys would be heavy, "this or [a] similar operation would have to be undertaken, if it were not for the question of their operation in conjunction with further landing operations." *ibid.*, 394.

⁸ Hessler, The U-Boat War in the Atlantic, III, 58. Although this program had been established prior to D-Day, it undoubtedly became more effective and its graduates more proficient in the use of schnorkel as time passed. By October of 1944 the final stage of schnorkel training was carried out at Horten, Norway. Admiralty notes on German naval engineering, based on the interrogation of U-boat prisoners of war and promulgated in February 1945, state that the training and schnorkel trials at Horten took about four days. Air Ministry, "The RAF in Maritime War," V, 93; "Interrogation of Prisoners of War - Miscellaneous notes on German Naval Engineering (2)," 4, February 1945, PRO ADM 223/263.

from major overhauls in Canada, increasing the squadron's operational strength. On 13 July, two further aircraft arrived. Canso "A" 9765, carrying two new crews from 116 (BR) and 161 (BR), was accompanied by Canso "A" 11060, which was a new addition to the squadron. A special effort was made to train the new crews in local procedures so that they could take part in operations as soon as possible, and some of this training was carried out in conjunction with local naval forces.⁹

The squadron's experiences in June also affected its training programme. July began with a new emphasis on dinghy training. A Safety Equipment Section was created, responsible for servicing and maintaining safety equipment as well as instructing aircrew in its care and use. Demonstrations of the inflation and use of the various dinghies were given at the marine dock near the camp, where exposure suits and signalling pyrotechnics were also demonstrated. Aircrew then paddled the dinghies around the harbour and familiarized themselves with the equipment and its operation, including the righting of overturned dinghies. Extensive "dry" drills followed, using an aircraft in the hangar, and the ditching drill had to be carried out at least five times or until the crew were completely familiar with their own roles as well as those of other members. They were now ready for "wet" dinghy drills, consisting of an actual water landing in Seydisfjord, next to Camp Maple Leaf. The crew then carried out the ditching drill, observed by F/L Buchanan, the officer overseeing the Safety Equipment Section. Crews were left in the water for at least thirty minutes, where they carried on as if they were actually out at sea. A lecture about any mistakes that might have been made followed the practice, and a general discussion was held about improvements that might be made. "This is a most important part of our training," the ORB noted, "in view of recent ditchings, as results of flack from U/Boats."¹⁰

⁹ 162 (BR) ORB, 1, 8, 5, 13,15, 12 July 1944. The ORB claims that three aircraft arrived on 13 July, but this appears to be in error.

¹⁰ *ibid.*, July 1944, Appendix C, "Safety Equipment Section and Air Sea Rescue Section," 1-2; *ibid.*, 3 July 1944.

The experiences of June also led to alterations in the squadron's safety equipment. The loss of Chapman's and Hornell's Cansos and the ordeals endured by their crews highlighted deficiencies in the aircraft's equipment. In both cases the old style RCAF "Mae West" lifejacket was used by the aircrew, and problems were experienced with the jacket slipping too far up around the wearer's head.¹¹ New RAF type "Mae Wests" with features that included straps fastening under the wearer's legs that prevented the jacket from riding up were in fact available, but 162 (BR) had not been notified. By the end of July 1944, the new style of "Mae West" had been procured from an RAF Equipment Depot by aircraft operating out of Wick, and all aircrew were issued the new gear.¹² The RCAF ditching suits used by Chapman and his crew had also displayed some shortcomings; after half an hour in the water, the suits became so waterlogged that they acted as negative buoyancy and impeded movement to the extent that the wearer could not be assisted by others. The ditching drill adopted by the squadron in July of 1944 required the suits to be loaded aboard the dinghies rather than worn by the crew except in certain unspecified circumstances.¹³

¹¹ AOCinC EAC to Secretary, DND for Air, Ottawa, "Reports of R.C.A.F. Ditchings," 2, 27 September 1944, NAC RG 24, vol. 3412, file HQ.466-2-2, vol. 2, "Air/Sea Rescue Services - RCAF Aircraft Ditchings - Report On"; Questionnaire Regarding Forced Alighting of Aircraft on Water, Canso "A" 9816," para. 9 (g), NAC RG 24, vol. 3412, file HQ.466-2-2, vol. 2.

¹² AOCinC EAC to Secretary, DND for Air, Ottawa, "Reports of R.C.A.F. Ditchings," 27 September 1944, NAC RG 24, vol. 3412, file HQ.466-2-2, vol. 2; CAS to AOCinC, EAC, "Reports of R.C.A.F. 'Ditching'," 9 September 1944, NAC RG 24, vol. 3412, file HQ.466-2-2, vol. 2; 162 (BR) ORB, July 1944, "Safety Equipment and Air Sea Rescue Section," 2.

¹³ Questionnaire Regarding Forced Alighting of Aircraft on Water, Canso "A" 9816," para. 13-4, NAC RG 24, vol. 3412, file HQ.466-2-2, vol. 2; 162 (BR) ORB, July 1944, "Safety Equipment and Air Sea Rescue Section," 2. The squadron does not seem to have been fully equipped with ditching suits prior to June 1944, since the Safety Equipment report for July records that due to losses of aircraft only 34 exposure suits remained, although some 110 were on order. Since one suit would have been carried for each crew member, each aircraft loss would have resulted in the loss of eight suits. This suggests that the squadron only had some sixty or seventy suits available, since four aircraft were lost by in the period of June and July 1944. The problem of waterlogged suits appears to have received some consideration at RCAF Headquarters in Ottawa, although the outcome of any discussions remains unknown. Minute from DDFC/SRS to DOR/OR4, 31 August 1944, NAC RG 24, vol. 3412, file HQ.466-2-2, vol. 2.

Although the lifejackets and ditching suits were subject to criticism because of their deficiencies, the problems experienced with dinghies received the largest share of the attention from Eastern Air Command in Halifax and Air Force Headquarters in Ottawa. On 21 July, the AOCinC of RCAF Overseas wrote to AFHQ in Ottawa about the ditching of Canso 9816 on 13 June. "It will be noted," the letter states,

that the above-mentioned aircraft was fitted with two "M" type dinghies, one of which burst on inflation. Three members of the crew of eight were lost, apparently due to inadequate dinghy accommodation, and it is thought that if the R.A.F. scale of [emergency] equipment had been provided, the whole crew would have survived.¹⁴

The questionnaire had apparently been in error about the type of dinghy carried. Two USN Mk. IV type D dinghies had actually been carried, and they provided sufficient flotation for the crew of eight.¹⁵ The bursting of one of the dinghies, however, had left the crew in a precarious position and undoubtedly contributed to the deaths of three of its members. Among the suggestions made by the surviving crew of 9816 was the provision of a one man ("K" type) dinghy for each crew member, and EAC asked AFHQ in Ottawa to clarify policy on the carriage of this equipment so that action could be taken by the Command.¹⁶

Ottawa apparently took some time to digest and discuss this information, since the first minutes concerning the squadron's safety equipment do not appear until 31 August, when the pronouncement by RCAF Overseas HQ on 21 July that the RAF scale of safety equipment was superior to that of the RCAF was attacked. In the light of a recent inspection in Sydney, however, it was acknowledged that RCAF aircraft were not always

¹⁴ AOCinC, RCAF Overseas to AFHQ, "Ditching - Canso 'A' Aircraft," 21 July 1944, NAC RG 24, vol. 3412, file HQ.466-2-2, vol. 2. While the RAF scale of emergency equipment is given in this letter, no indication of the number of personnel it could carry is given, since references are to "D" type dinghies without giving their capacity. The vast majority of secondary works seem to be content making similar references without explaining them.

¹⁵ AOCinC EAC to AFHQ, "Reports of R.C.A.F. Ditchings," 1, 27 September 1944, NAC RG 24, vol. 3412, file HQ.466-2-2, vol. 2.

¹⁶ Questionnaire Regarding Forced Alighting of Aircraft on Water, Canso "A" 9816," para. 13-6, NAC RG 24, vol. 3412, file HQ.466-2-2, vol. 2; AOCinC EAC to AFHQ, "Questionnaire Regarding Forced Alighting of Canso A.9816 on 13th June, 1944," 14 August 1944, NAC RG 24, vol. 3412, file HQ.466-2-2, vol. 2.

equipped to the proper scale of dinghies and emergency equipment, and that until they were, such criticisms could be expected. The recommendation from the survivors of W/C Chapman's crew that individual dinghies be carried prompted the observation that the current RCAF scale for "K" type dinghies allowed one for each crew member of Canso aircraft, and that the ditching on 13 June had merely been another example of aircraft operating without proper equipment, and it was recommended that the matter of safety equipment for Cansos and other BR aircraft be discussed at an upcoming meeting.¹⁷

Another minute written on the same day widened the discussion to include the bursting of one of Canso "A" 9754's dinghies following Hornell's attack on 24 June. While the survivors had recommended that lower charges be carried by the CO₂ bottles used to inflate the dinghies, experts in Ottawa seemed convinced that the problem lay with the type of dinghy used. Two other instances of USN Mk. IV dinghies bursting had been recorded in the months prior to August, and the opinion seemed to be that had RCAF "H" type dinghies been carried, the problem would not have occurred, since there were no recorded instances of the "H" type dinghy exploding.¹⁸ In both cases, inadequate or inappropriate equipment was blamed for the hardships experienced after ditching.

The issue was not abandoned after this point, however. The meeting mentioned in the first minute apparently tried to assign blame for the inadequacy and paucity of safety equipment in 162 (BR)'s Cansos. A marginal note on this minute, dated 8 September, describes a letter being written to EAC to be signed by the Air Member for Air Staff (AMAS) "pointing out the errors in equipment and procedure in an attempt to make the

¹⁷ Minute, DDFC/SRS to DOR/OR4, 31 August 1944, NAC RG 24, vol. 3412, file HQ.466-2-2, vol. 2. A recent visit to RCAF Station Sydney had revealed that none of 116 (BR)'s Cansos were equipped to scale. The minute refers only to a visit to Sydney, but 116 (BR) was the only squadron operating Cansos from that base at that time. 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), 656; Samuel Kostenuk and John Griffin, RCAF Squadron Histories and Aircraft, 1924-1968, (Toronto: Samuel Stevens Hakkert & Company, 1977), 49.

¹⁸ Minute, DDFC/SRS to AMAE/DDQ, 31 August 1944, NAC RG 24, vol. 3412, file HQ.466-2-2, vol. 2.

Command bear the responsibility for actions already detailed to them by numerous means.”¹⁹ This letter was signed and sent the following day, signed by the AMAS on behalf of the Chief of the Air Staff (CAS). Numerous deficiencies in Canso “A” 9816’s safety equipment were pointed out, based on an examination of the questionnaire completed by the survivors. The letter stated that the dinghy accommodation had been inadequate even before one had burst, and that no mention had been made of the various emergency kits that were to have been carried. Furthermore, the individual “K” type dinghies recommended by the survivors were already part of the scale of safety equipment and had been available for several months, and “very definite instructions regarding the carrying of emergency kits and dinghies” had been issued three times since 7 March 1944, so it was “evident that Canso A 9816 was not equipped to scale.”²⁰ The letter also stated that improved RAF pattern “Mae Wests”, replacing the RCAF version criticized by survivors, had also been introduced several months ago. “It is felt,” the letter stated

that, due to the fact that the aircraft was not equipped according to the Orders quoted in paragraph five above [the instructions regarding the carrying of emergency kits and dinghies], the crew of Canso 9816 was exposed to unnecessary hardships which may have contributed to the loss of three crew members. May action be taken to investigate this matter fully and a report submitted to this headquarters advising what steps are being taken to remedy this situation.²¹

The ball was now in Eastern Air Command’s court.

The reply came on 27 September, and corrected some of Ottawa’s criticisms, while revealing some of the reasons for the squadron’s inadequate carriage of safety equipment. While the CAS’ letter of 9 September dealt with the ditching of Canso “A” 9816 on 13 June, EAC’s response also drew evidence from the ditching of 9754 on June 24th. In the first place, enquiries by the Command had revealed that sufficient flotation had been provided for the crew of 9816; instead of the two type M dinghies with a total capacity of

¹⁹ Minute, AMAS/DOR/OR2 to DDFC/SRS, 8 September 1944, NAC RG 24, vol. 3412, file HQ.466-2-2, vol. 2.

²⁰ CAS to AOCinC EAC, 9 September 1944, NAC RG 24, vol. 3412, file HQ.466-2-2, vol. 2.

²¹ *ibid.*

six that had been described in the questionnaire, two USN Mk. IV dinghies with a total capacity of eight had been carried.²² The authorization of two type H dinghies with a capacity of ten, although it dated from 1 April 1944, had not been issued for several weeks afterwards and by the time it was received by 162 (BR) and action was taken to obtain the new dinghies, the two ditchings had already occurred. As a result, EAC felt that “the Squadron was not at fault at this time as sufficient flotation was provided,” but steps were being taken to find out why the squadron had experienced a delay in receiving the appropriate amendment list.²³

EAC also attacked Ottawa’s claim that 162’s Cansos should have been carrying the K type dinghy since orders to that effect had been issued. The orders to which Ottawa referred, the Command noted, did not state that such dinghies were to be carried. Likewise, the assertion that the squadron’s personnel should have been equipped with the new style of “Mae West” was also rebuffed, since 162 had not been notified that the new type was available. Since the ditchings, the letter noted, both the dinghies and the lifejackets had been procured from an RAF Equipment Depot. The issue of emergency kits was also dealt with. Although the survivors of 9816 had made no mention of such kits, 9754’s crew had referred to them as “food ration kits” which in any case had not been used since they had been thrown overboard in order to make room in the single life raft that remained in both ditchings.²⁴ Finally, the issue of bursting dinghies was addressed. During the first ditching, on 13 June, the dinghy had burst because it had hit a sharp projection on the aircraft. The assertions that either an incorrect charge in the CO₂ bottle or a defective dinghy were responsible could not therefore be conclusively proven. The bursting of the dinghy on 24 June, however, could have been the result of an incorrect CO₂

²² The two USN dinghies were carried because there had been a shortage of the authorized type H dinghies and the scale of equipment for the Cansos in December 1943 had provided flotation for only seven men, while the squadron intended to fly eight man crews. AOCinC EAC to CAS, 27 September 1944, NAC RG 24, vol. 3412, file HQ.466-2-2, vol. 2.

²³ *ibid.*

²⁴ *ibid.*

charge or a defective dinghy, but it might also have been the result of a puncture caused by sharp corners on the emergency kits, which at the time were not covered in canvas or padded at the corners. Measures had since been taken to cover them and pad the corners in the same way that later kits had been prepared. Later correspondence, however, stated that “it is an established fact that the subject dinghies burst due to an overcharge of the CO₂ bottle,” and implies that EAC may have ordered such an increase because 162 (BR) was operating from a northern base in wintertime but then failed to order reduced charges for summertime operations. In any case, lack of attention to ditching drills by the squadron prior to June 1944 meant that these problems were not noted, and the lack of preparedness undoubtedly contributed to the hardships experienced by survivors in June 1944.²⁵

What cannot escape notice is that on several occasions 162 (BR) had not been notified of changes in the scale of safety equipment required for its Cansos. No notification had been received prior to June 1944 that the aircraft were to carry two H type dinghies, which had never been known to explode, so the USN Mk. IV dinghies, which suffered several instances of explosion on inflation, continued in service.²⁶ Although the promulgation of this order was delayed for several weeks after its issue on 1 April, 162 did not receive the order at this time, and did not receive it in time to obtain the new, more reliable dinghies. The shortage of the H type dinghy in December of 1943, immediately prior to the squadron’s move to Iceland, should also be noted. It was this shortage, coupled with the need to provide flotation for eight instead of seven crew members, that forced the squadron to use the American equipment.²⁷ A delay in receiving other orders concerning safety equipment meant that 162’s aircrew were still using the older, more

²⁵ *ibid.*

²⁶ *ibid.*; Minute, DDFC/SRS to AMAE/DDQ, 31 August 1944, NAC RG 24, vol. 3412, file HQ.466-2-2, vol. 2. In fairness, it should be pointed out that H type dinghies might well have exploded on inflation and as a consequence no-one survived to report the defect.

²⁷ AOCinC EAC to CAS, 27 September 1944, NAC RG 24, vol. 3412, file HQ.466-2-2, vol. 2. In this letter, EAC states that the relevant Command Orders and Instructions covering safety equipment had been forwarded to 162 (BR), apparently sometime in mid-December.

poorly designed RCAF type “Mae West” rather than the better RAF type.²⁸ Although the role of these lifejackets in the hardships experienced by the ditched crews is less important and obvious, the fact that the squadron had not been notified that new, improved equipment was available speaks poorly for the communications between headquarters and 162 (BR). In a November summary of the squadron’s safety equipment problems, the Officer Commanding noted the lack of a fast supply service from Canada before and during June, which led to Coastal Command’s supplying the more modern safety equipment, and stated that “a more active interest must be taken by R.C.A.F. Eastern Air Command and prompt action taken to supply this Squadron with modern equipment that will be comparable to Coastal Command equipment.”²⁹ Coupled with the squadron’s persistent difficulties in obtaining essential basic equipment, such as air compressors and aircraft spares, the shortages of essential safety equipment and the failure to notify the squadron of important safety changes suggest an inability on the part of the RCAF to support a squadron operating outside of Canada and Newfoundland without extensive assistance from Allied forces.³⁰

²⁸ *ibid.* See also CAS to AOCinC EAC, “Reports of R.C.A.F. ‘Ditching’,” 9 September 1944, NAC RG 24, vol. 3412, file HQ.466-2-2, vol. 2, and Minute, DDFC/SRS to DOR/OR4, 31 August 1944, *ibid.*, for details of the differences between the two types of lifejacket.

²⁹ OC 162 (BR) to AOCinC EAC, “No. 162 Squadron - Bursting of Dinghies & Safety Equipment Servicing Problems,” 24 November 1944, DHist 181.009 (D2441). This letter also discusses the efforts to improve the squadron’s safety equipment section and the problems encountered in the process.

³⁰ With the exception of some squadrons that served in the Aleutian campaign, 162 (BR) was the only non-Article 15 RCAF squadron during the war that served outside of Canada and Newfoundland. The Article 15 squadrons, numbered in the 400 series, were financed and provided with aircraft and equipment by the RAF, with Canada reimbursing the United Kingdom. This meant that spares and servicing facilities were readily available and that the RCAF squadrons were not directly dependent on a sometimes tenuous link to Canada for their supply of parts and for bases at which major maintenance could be carried out. In all fairness, it should be pointed out that only one RCAF transport squadron, 168 (HT), was able to carry out regular supply flights because it was the only such squadron equipped with Liberators, and they did not enter service with the squadron until October 1944. Much of its transport efforts were devoted to carrying mail to and from Canada, which limited its ability to supply 162 (BR). While 10 and 11 (BR) occasionally carried out transport flights, most notably with 11 (BR)’s transport “The Basterpiece,” (s.n. 3704), for obvious reasons their aircraft could not be diverted from the Battle of the Atlantic too frequently. The other major transport squadron in Eastern Air Command, 164 (T), was not supposed to make transport flights to Reykjavik except in an emergency, because its Dakotas

The hardships endured by 162's crews after ditching and the reports that they made did bring about some improvements in safety equipment for all Bomber Reconnaissance squadrons, however. EAC intended to use an aircraft captain as Air-Sea Rescue Officer, presumably to obtain an aircrew perspective on the subject and to ensure that safety equipment and directions would be appropriate for its personnel. The carriage of type K dinghies in addition to multiplace dinghies was made mandatory on all Canso aircraft, largely on the basis of the recommendation made by the crew of Canso 9816. The issue of these dinghies to all BR aircraft, both in operational and training units had earlier been authorized, but the Commands had objected to their carriage because of their extra weight. As a result, they had not been included in instructions outlining absolutely essential emergency equipment, and had not been carried in many aircraft, including 162 (BR)'s Cansos.³¹

While the squadron's safety equipment and training was being revamped in light of the events of June, its gunnery also received attention. Like the work with safety equipment, the changes in gunnery involved both training and equipment. Early in July F/O West, the Squadron Gunnery Officer, reorganized the squadron's gunnery section in conjunction with the Station Armament Officer and Wing Commander Flying. Guns were tested, a new air firing range was created, improvements to various target ranges were made, and a lecture programme was begun.³² From late June onwards, the squadron had been requesting new armament to replace the inadequate forward firing guns. On 24 June,

were not considered suitable for long-range operations over water on a regular basis. C.P. Stacey, Arms, Men and Governments: The War Policies in Canada, 1939-1945, (Ottawa: Queen's Printer, 1970), 263; Kostenuk and Griffin, RCAF Squadrons and Aircraft, 70, 73-74; Carl Vincent, Canada's Wings, vol. 2: Consolidated Liberator & Boeing Fortress, (Stittsville, Ont.: Canada's Wings, 1975), 135; CAS to AOCinC, EAC, "Air Shipments to Iceland," 20 July 1944, DHist 181.003 (D4864).

³¹ The decision was reached sometime between 4 and 6 October that orders would be amended to include type K dinghies in Canso emergency equipment. AOCinC EAC to CAS, 27 September 1944; Minute, DAC to AMAS, 4 October 1944; Minute, AMAS to DAC, 6 October 1944; NAC RG 24, vol. 3412, file HQ.466-2-2, vol. 2.

³² 162 (BR) ORB, 6 July 1944.

the same day that Hornell and his crew found their armament lacking in their encounter with *U-1225*, 162 (BR) sent a message to EAC requesting new forward firing armament. This message was sent before the squadron was aware of the circumstances surrounding that day's actions, which shows that dissatisfaction with the twin gun installation in 162's Cansos predated the serious problems with their armament encountered by Hornell and his crew. The present installation was described as

most inadequate. Guns lack flexibility. Sighting practically impossible. Ammunition feed causes numerous stoppages. Desire a new installation [with a] power operated turret [holding] quadruple guns. Understand Americans using this type installation in Canso aircraft. Advise.³³

The Canadian Joint Staff in Washington was asked to investigate the details of this turret, but it appears that Air Force Headquarters in Ottawa was unaware of the type of installation carried by 162's Cansos, since a request was sent to EAC asking them to provide details and photographs of the installation.³⁴

Eastern Air Command was aware of the deficiencies of the armament of 162's Cansos, and came up with an even more radical proposition for alleviating the problem: have Coastal Command re-equip the squadron with Consolidated Liberators. On 27 June, after discussion with the Chief of Air Staff in Ottawa, A/V/M G.O. Johnson, AOCinC EAC, sent the following message to Sholto Douglas, AOCinC of Coastal Command:

It would appear that 162 Squadron RCAF is doing good work but that Canso aircraft with which they are equipped are too slow and under-armed to cope with present state of U-boat anti-aircraft fire. Would like to see Squadron re-equipped with Liberators as [I] am sure they would do even better work on that type but

³³ 162 (BR) to EAC Canada, signal A.80, 24 June 1944, NAC RG 24, vol. 5434, file HQS.457-1-17, vol. 1, "Canso Aircraft: Armament"

³⁴ Minute, Arm. O3 to AMAS:DOR, 26 June 1944; Minute, Arm.O3 to DOR, 28 June 1944; NAC RG 24, vol. 5434, file HQS.457-1-17, vol. 1. The latter minute may either be evidence that nobody in Ottawa was familiar with the twin gun installation in EAC Cansos, or that the modified installation proposed by 162 (BR) in early 1944 (see Chapter 5) had been installed by the squadron. The statement that the current installation suffered from "numerous stoppages" tends to suggest that the modified installation had not been made in the squadron's Cansos. There appears to be no definite answer to this question, but no mention of the modified installation is made in correspondence or documents dealing with the aircraft losses in June of 1944. Unless unequivocal evidence is located, it should probably be assumed that the modifications to the twin nose guns were not carried out.

cannot obtain allocations for re-equipment on this side. Would it be possible for you to re-equip them with Liberators from your resources?³⁵

Unfortunately, it did not prove possible for Coastal Command to re-equip 162 (BR) with Liberators. Plans to send either 10 (BR) or the re-equipped 11 (BR) to Iceland to replace 162 and its Cansos, which were being discussed in late June 1944 also never came to fruition.³⁶ The plans to upgrade the Canso's forward firing armament, however, brought results later in the year.

While the squadron was being built back up to strength and improving its equipment, operations from Wick continued, although much less eventfully than they had in June. As mentioned above, no sightings were made in the Northern Transit Area during the first half of July by any Coastal Command aircraft. By 12 July the redeployment of Coastal Command squadrons to 18 Group had begun. Anticipating the time when U-boats would be forced to operate exclusively from Norwegian bases, plans had been made to reinforce 18 Group with squadrons and detachments from 15 and 19 Groups (see Map 5). On 12 July 206 Squadron, flying Liberators, moved to Leuchars from St. Eval, and six days later detachments from 59 and 120 Squadrons, which flew the same aircraft, arrived in Tain from Ballykelly (see Map 5). The arrival of these Liberators allowed Coastal Command to carry out operations much further north in the NTA than before, especially since 59 and 120 Squadrons operated the specially modified VLR Liberators.³⁷ As a result of this reinforcement and increase in operational flexibility, the Northern Transit Area was

³⁵ At this time the RCAF was hard-pressed to equip a second squadron, 11 (BR), with Liberators. A recent hangar fire at Gander had destroyed four of 10 (BR)'s aircraft, and the eight allocated to 11 (BR) had been reduced to four since 10 (BR) had to be brought back up to strength. Johnson to Douglas, signal A.73, 27 June 1944, quoted in AOCinC EAC to AFHQ Ottawa, "Re-Equipment of Anti-Submarine Squadrons," 29 June 1944, NAC RG 24, vol. 5396, file HQS.60-3-12, vol. 5, "PBY Flying Boats." According to the official history, however, Douglas had made the proposal to the RCAF, so this message may have been a counter-proposal to the RAF, especially since the RCAF was experiencing such difficulties in obtaining Liberators. Douglas, The Creation of a National Air Force, 602.

³⁶ AOCinC EAC to AFHQ Ottawa, "Re-Equipment of Anti-Submarine Squadrons," 29 June 1944, NAC RG 24, vol. 5396, file HQS.60-3-12, vol. 5, "PBY Flying Boats"

³⁷ Air Ministry, "The RAF in Maritime War," V, 53; "Coastal Command Order of Battle, Strength and Availability, 5th June, 1944," *ibid.*, App. I. During June no Liberators had been operating with 18 Group.

divided into three operational areas. The first was to the east and northeast of the Shetlands up to 65° N, the second north of the Shetlands up to 67° N, and the third was between Iceland and the Hebrides. Forces were sufficient to provide a concentration in one of the areas if necessary or if patrols brought good results, but not to provide heavy coverage in all three areas. For 162 (BR), these July patrols would not repeat June's activity, even though some of its patrols were carried out farther north than 66° N. Instead, it was the other squadrons operating to the north of the British Isles that fought many actions with U-boats during the latter part of July.³⁸

The first of these attacks was made by Liberator Q/206 on 13 July, when a U-boat was sighted only two miles away amid driving rain. The attack, which came about fifteen seconds after submergence, failed to damage *U-771* which had been recalled to Bergen from the patrol line.³⁹ Early on the 15th, M/206 sighted a periscope directly underneath, but was unable to attack. Some seven hours later, however, E/206 sank *U-319*, which had formed part of the reduced offshore patrol line. The Liberator was shot down by the submarine's flak, and at least one survivor managed to board a dinghy and was apparently spotted by Liberator B/206, which also observed a large oil patch nearby. The sole survivor was still in the water the following day, when Canso "A" 9777, flown by F/O Hildebrand and crew, was called upon to help in the rescue. Homed in by a Catalina, the Canso arrived at position 57° 51' N 04° 47' E at 1127 hours. The Canadian crew immediately began the homing procedure to summon a High Speed Launch and dropped marine markers to mark the dinghy's position, also dropping a bag holding food and water near the dinghy, but the survivor made no attempt to reach it. By 1715 hours the HSL had still not arrived, but another Liberator showed up and dropped smoke floats to mark the

³⁸ Air Ministry, "The RAF in Maritime War," V, 53. Canso "A" 9777 appears to have carried out the most northerly patrol by the squadron during this time, patrolling the area bounded by 65° 39' N 04° 09' E, 66° 02' N 02° 05' E, 66° 41' N 03° 02' E, 66° 18' N 02° 30' E. The information about the location of the squadron's patrols, however, is incomplete, so other patrols may have been carried out even farther north. "162 (RCAF) Squadron Operations with 18 Group from Wick," 19.

³⁹ Air Ministry, "The RAF in Maritime War," V, 54.

dinghy's location at the request of the Canso's crew. Less than an hour and a half later, the survivor fell out of the dinghy and after hanging on to the ropes for a few minutes, during which time he managed to wave at the Canso, he apparently collapsed, and at 1950 hours he drifted away from the dinghy, face down in the water. By this time the HSL was almost on the scene, but had first investigated an Airborne Lifeboat some three quarters of a mile from the dinghy at about 2005 hours.⁴⁰ Visual signals and flares fired by the Canso then attracted its attention, and by 2025 hours the body of Sergeant N. Hilton was picked up by the HSL. Canso 9777 then sank the abandoned dinghy by gunfire and set course for Wick.⁴¹

While the rescue effort was underway, another attack and a sighting had been made in the Northern Transit Area. At midnight on 15/16 July, a Liberator from 206 Squadron had struck again, trading fire with *U-299*, one of the Group *Mitte* patrol line off the Norwegian coast. The subsequent depth charge attack failed to inflict any damage, but the captain and one rating on the submarine were seriously wounded by machine gun fire from the attacking aircraft.⁴² On the 16th, Catalina O/210 sighted a periscope but was unable to attack. This was probably *U-286*, another member of the offshore patrol line. The next day, Mosquito L/333 attacked *U-994*, returning from the patrol line, inshore and close to Bergen, wounding five crew with cannon and machine gun fire. At this point BdU decided

⁴⁰ Daniels, in Rescue From the Skies, makes an unclear reference based on some "unrelated papers" to an Airborne Lifeboat being dropped to a survivor seen near the wreckage of a Liberator. The survivor was too weak to board the lifeboat. This seems to describe the above reference to the Airborne Lifeboat, except for the fact that Daniels describes the plane making the drop as being from St. Eval, in Cornwall, at the southern tip of the British Isles, and states that no reference to this rescue exists in the records of squadrons at St. Eval or in the area at the time. Stephen Brewster Daniels, Rescue From the Skies: The Story of the Airborne Lifeboats, (London: HMSO, 1993), 80.

⁴¹ Air Ministry, "The RAF in Maritime War," V, 54; Norman L.R. Franks, Search Find and Kill: Coastal Command's U-boat Successes, (Bourne End: Aston Publications, 1990), 51; "162 (RCAF) Squadron Operations with 18 Group from Wick," 9-10. The only mention of this rescue effort in the ORB is contained in the flying record for July 17, which simply records that 9777 was carrying out an ASR flight, while the narrative of 162 (BR) operations from Wick makes no mention of the outcome of the rescue.

⁴² Air Ministry, "The RAF in Maritime War," V, 54.

to withdraw the remaining boats on the offshore patrol line due to the danger posed by Allied air patrols off the Norwegian coast. After the war, Hessler wrote that

because of continuous daylight at this time of year and the consequent added danger from air attack, the six boats hitherto keeping watch off the coast were withdrawn on 16th July when it was revealed that U.319 was missing and that three other boats had suffered bomb damage. After the withdrawal of the anti-invasion guard, group *Mitte* remained distributed among Norwegian ports, its strength being maintained for a while at 22 boats; but, from the end of July, 14 of these were transferred, at intervals, to Libau and Revel for operations against Russian naval forces in the Gulf of Finland, their place being taken by six schnorkel boats.⁴³

As a result of this repositioning of forces, 162's Cansos and the other Allied aircraft operating in the Northern Transit Area stood even less chance of encountering a U-boat. During the remainder of the month, only four more attacks were made on submarines in the Northern Transit Area proper.

At this point, two detachments of Liberators arrived to bolster 18 Group. On 18 July, as already mentioned, detachments of VLR Liberators from 59 and 120 Squadrons, both from Ballykelly in Northern Ireland, arrived in Tain. The same day, Mosquito K/333 attacked *U-286*, bound for port after being recalled from the offshore patrol line. One crew member on the boat was killed and seven others, including the captain, were seriously wounded by cannon fire. Canso 9777 had been on patrol in the Northern Transit Area that day, to the west of the attack, and although sightings were made to the north and south of its patrol area, the Canadians only spotted a Faeroese fishing vessel and a large school of whales. Another crew from 162 (BR) encountered one of the many hazards of operational flying just before midnight on the 19th, when Canso 9755, carrying F/O Leech and crew, ran into a flock of seagulls shortly after takeoff. The aircraft promptly returned to base and was inspected for damage. None was found, so the crew took off for the second time and successfully carried out their assigned patrol. The next day, Mosquito N/333 attacked *U-*

⁴³ Hessler, *The U-Boat War in the Atlantic*, III, 80. Hessler gives the date for this order as 16 July, while "The RAF in Maritime War" gives the date as 17 July; there is either an error in one of the sources, or the difference in time and date-keeping between German naval forces and Allied forces is responsible.

863, which was accompanied by an escort vessel, just off the Norwegian shore. Three of the submarine's crew were badly wounded, and it was forced to put back into port.⁴⁴

After three and a half weeks of patrols without a sighting, 162 (BR) was directly involved in the search for a U-boat on 24 July. An aircraft in transit had reported a sighting to the southwest of the Faeroes, and four aircraft carrying out transit reconnaissance patrols from Wick to Reykjavik were diverted while en route to investigate. Despite extensive searches by 162's Cansos and other aircraft that joined the search, no evidence of a submarine was found. The effort had almost certainly been in vain, since there is no record of a U-boat anywhere near the location of the sighting at that time. However, this search revealed one of the drawbacks of the forced reliance on Reykjavik for inspections and servicing while operations were carried out from Wick. The ORB noted that "this extra [flying time] will run all these aircraft approximately 7-12 hours over their check period. If urgent, this is O.K. but [it] will shorten [the] period to [the] next check."⁴⁵ In other words, any diversion of Cansos during their return flights to Reykjavik shortened the allowable flying time between the check and servicing that would be carried out after their arrival in Iceland and the check and servicing that followed. The steady pattern of operations from Wick was planned with aircraft operating on an interval of fifty hours between inspections and servicing. This allowed a transit flight from Reykjavik to Wick, two flights in the Northern Transit Area, and a transit flight to Reykjavik from Wick, after which the aircraft was due for an inspection. Any change in the time between inspections, however, would affect the squadron's ability to carry out operations from Wick. Once again, the problem of having to rely on Reykjavik for maintenance was demonstrated, as were the limitations imposed by operating an aircraft for which the RAF could not supply many necessary spares or maintenance facilities.

⁴⁴ Air Ministry, "The RAF in Maritime War," V, 54; "162 (RCAF) Squadron Operations with 18 Group from Wick," 10, 21.

⁴⁵ "162 (RCAF) Squadron Operations with 18 Group from Wick," 7-8; 162 (BR) ORB, 24 July 1944; "U-Boat Dispositions, 24 July 1944," Air Ministry, "The RAF in Maritime War," V, Map 21.

Action continued in the Northern Transit Area, and on 25 July, 333 Squadron struck again, with another attack on an escorted U-boat close to the Norwegian coast. Mosquitoes E and F/333 inflicted slight damage on *U-244* with their depth charges, but cannon fire seriously wounded six crew on the boat and it was forced to return to Kristiansand South. Two days later Liberator R/86 attacked *U-865* off Trondheim. This was the U-boat's second attempt to proceed overseas, but damage forced a return to port. No more attacks were made during July. In contrast with June, only eighteen U-boats had been at sea in the Northern Transit Area during July. Of these eighteen, ten had been sighted and eight attacked. The attacks had sunk one boat and forced six others to return to harbour, and also compelled BdU to withdraw the remnants of Group *Mitte's* offshore patrol line by the middle of the month. Only one U-boat, *U-855*, actually passed through the transit area and into the Atlantic during the entire month.⁴⁶

On 25 July, 162 received a request to take part in a very different mission. The AOC Iceland requested that a Canso be sent to northwestern Iceland on a mercy flight, and W/C Chapman agreed to the attempt after investigating the available landing facilities. At 0120 hours on the 26th, W/C Chapman, along with F/L MacBride and crew, flew to Adalvik (see Map 3), where the Canso landed in a bay. The aircraft taxied around for about an hour while the patients were brought out in a rowboat, since there were no moorings available. A three month old baby suffering from a severe case of mastoids was evacuated, along with the baby's parents and a grandmother who was also sick. By 0600, Canso "A" 9765 had returned to Reykjavik, safely delivering the patients on board.⁴⁷ The squadron had received another urgent message on the 25th, but this time the delivery and not the picking up of a person was required. Flying Officer Denomy, Hornell's co-pilot during the attack on 24 June, was required in Ottawa for a very important radio programme

⁴⁶ *ibid.*, 54-55.

⁴⁷ 162 (BR) ORB, 25-26 July 1944; "Canadian Flyers Fetch a Sick Child from Adalvik," *Morgunbladið*, 29 July 1944, DHist 86/129. Adalvik is in the far northwest of Iceland and even now is not connected by road to the rest of the island.

to be broadcast sometime between 28 and 31 July. The reason for this request was revealed three days later, when the squadron ORB recorded that

at 1700 hours received word over B.B.C. broadcast that F/L Hornell had been posthumously awarded the Victoria Cross. This is indeed a very great honour and is most deserved. We, the squadron as a whole, are very proud that F/L Hornell was one of us. We are sad only in the fact that he is not alive. A very great price to pay.⁴⁸

The squadron continued to pay the price, even if it did not encounter the enemy. At 0634 hours on 29 July Canso "A" 11062, carrying F/O Hildebrand and crew, left Wick for a patrol in the Northern Transit Area and failed to return to base. At about 1930 local time, the aircraft crashed into a mountain on Foula Island in the Shetlands, leaving only one badly injured survivor, F/S J.H. Knight.⁴⁹ Poor weather was to blame for the crash, with the report for July 29th recording: "Shetlands very low cloud and poor visibility persistent. Mainland bases fit until 1600 hours when low stratus affected all East Coast, with fog at Wick."⁵⁰ Even when the enemy remained unseen, other hazards proved just as dangerous and unforgiving.

While the conditions in the Northern Transit Area in July did not lead to a repetition of the previous month's successes, the waters to the north witnessed activity strongly reminiscent of June's encounters. On 14 July the Home Fleet sailed from Scapa Flow to make another attack against the *Tirpitz* in northern Norway. Three fleet carriers, supported by a battleship, four cruisers, twelve destroyers and an escort group headed north, planning to launch an attack using naval aircraft on the night of 16/17 July. British Intelligence suspected that a U-boat patrol line existed to the southeast of Jan Mayen Island, and that the Arctic Flotilla had at least six to eight more U-boats based in Narvik. In order

⁴⁸ 162 (BR) ORB, 25, 28 July 1944.

⁴⁹ The crew consisted of F/O A. Hildebrand, pilot, F/O W.H. Lloyd, pilot, F/O G.G. Bradshaw, navigator, P/O J.E. Bowler, WAG, WO2 R.D. Harvey, WAG, F/S E.C. Watson, WAG, Sgt. R.W.E. Townsend, flight engineer, all of whom died in the accident. F/S J.H. Knight, flight engineer, suffered multiple injuries.

⁵⁰ 162 (BR) ORB, 30 July 1944, summary for July 1944; "162 (RCAF) Squadron Operations with 18 Group from Wick," 10.

to protect the naval force during its return from the attack, 18 Group planned a series of patrols using LR and VLR aircraft along its planned course. Maintaining patrols in Arctic waters as well as in the Northern Transit Area proper required additional aircraft, especially VLR Liberators. The movement of detachments from 59 and 120 Squadrons from Ballykelly to Tain on 18 July made patrols in both areas possible, and ushered in a series of actions that seemed to repeat the events of June in the Northern Transit Area.⁵¹

Early on 17 July the attack was launched on the *Tirpitz*, but it was thwarted by a heavy smokescreen covering the entire fjord where the battleship lay. Shortly afterwards, Captain U-boats Norway signalled some of Group *Trutz*, which lay in a line off Jan Mayen Island, to move at high speed to intercept the retiring British force. This requirement for high speed meant that the U-boats would have to operate on the surface. Early on the afternoon of the 17th, the first two patrols scheduled by 18 Group left base and both sighted U-boats in their patrol area. Thus began another series of battles between aircraft and surfaced U-boats. Peyton-Ward noted in the British official history that

none of the Arctic U-boat flotilla were fitted with schnorchels, neither had they had any previous experience of action with shore based aircraft. There was almost continuous daylight in these high latitudes and the flotilla was accustomed to move about freely on the surface. Moreover all boats carried the most up to date flak armament and the sea conditions between the 17 and 24 July were flat calm. Hence it was not surprising that surfaced action with the aircraft was invariably adopted.⁵²

Once again, the tactics of fighting back on the surface failed, and the U-boat group operating off Northern Norway was dissolved on 20 July, with all except four boats returning to harbour, but sightings and attacks continued for three more days. The same day, the Royal Navy carrier force returned to Scapa Flow, but 18 Group's patrols in arctic waters did not end until four days later. Between 17 and 24 July, 104 sorties were flown, some as far north as 72°. Eighteen sightings were made, resulting in fifteen attacks on eleven U-boats. Three submarines were sunk and four damaged while only one aircraft,

⁵¹ Air Ministry, "The RAF in Maritime War," V, 55.

⁵² *ibid.*, 55-56.

Liberator F/86, was lost. This week of activity represented the last occasion when Allied anti-submarine aircraft engaged surfaced U-boats on a widespread basis. Following the last patrols in Arctic waters on 24 June, 18 Group's anti-submarine aircraft reverted entirely to operations within the Northern Transit Area.⁵³

In this area the withdrawal of Group *Mitte*'s offshore patrol line in mid-July had marked the beginning of a decline in the group. Although it mustered a strength of twenty-two U-boats dispersed in Norwegian ports following the withdrawal of the patrol line, a series of transfers began by the end of the month. A total of fourteen boats were transferred to Libau and Revel at intervals in order to operate against Soviet naval forces in the Gulf of Finland, but they were replaced by six schnorkel boats, which probably made for a more than fair trade when the threat posed by Allied air power to non-schnorkel boats is considered.⁵⁴ In addition to the gradual draw-down of Group *Mitte*, U-boat traffic through the Northern Transit Area in the first half of July was minimal, amounting to four boats, one of which, *U-863*, was routed to the north of Iceland and entered the Atlantic through the Denmark Strait. Three more boats, *U-1229*, *U-396*, and *U-300*, took the more conventional route between Iceland and the British Isles, but only the first was to pass through the area unseen. The second boat developed a schnorkel defect on 13 August while still in the transit area and was forced to return to port. The third was attacked by Cansos from 162 (BR).⁵⁵

Late in the morning of 4 August, Canso "A" 9759, flown by F/O Marshall and crew,⁵⁶ was flying a course of 283° at 650 feet at the base of the clouds that covered the sky. Visibility varied between one and three miles when a wake was seen three miles

⁵³ *ibid.*, 55-58. For a more complete account of the actions between aircraft and U-boats during this time, see *ibid* and V.E. Tarrant, The Last Year of the Kriegsmarine, May 1944-May 1945, (London: Arms and Armour Press, 1994), 129-133.

⁵⁴ Hessler, The U-Boat War in the Atlantic, III, 80.

⁵⁵ Air Ministry, "The RAF in Maritime War," V, 58-59.

⁵⁶ The crew consisted of F/O W.O. Marshall, P/O A.J. Beck, W/O K.B. Klager, P/O J.V. Raymond, F/Sgt. J. Newa, F/Sgt. G.D. Thomas, F/Sgt. R. Waldbauer, and Sgt. G.F. Schmidt.

away, twenty degrees to starboard. The aircraft turned slightly to starboard and closed with the wake, which at one and a half miles was identified as a surfaced U-boat making between ten and twelve knots on a course of 115°. At this point the boat was sixty-five miles to the west-northwest of convoy UR 130, and weather conditions dictated an immediate attack since contact with the U-boat would have been lost in any attempt to gain a more favourable attacking position. The Canso made a steep diving turn to port, at which point the boat began to submerge. Attacking at right angles to the submarine's course, the front gunner managed one burst of fire at the conning tower before three Mark XI Torpex depth charges, set to explode at twenty-five feet, were released. The first depth charge exploded close to starboard of the U-boat's bow, the second exploded some 110 feet to port, and the third some 200 feet further on.⁵⁷

The boat, which had come to the surface about half an hour before, had only sighted the Canso at a range of 1,000 yards and had submerged to a depth of only twenty-six feet when the depth charges exploded. Both periscopes were damaged, as was the *Bali I* radar detector aerial on the schnorkel head. A diving tank and an oil tank were also damaged by the explosions. *U-300* also plunged bow-first to a depth of 295 feet. In the meantime, Marshall threw the Canso into a tight turn to port and then carried out an attack with a Mark 24 Mine, the acoustic homing torpedo. Immediately afterwards, the submarine resurfaced and opened fire with its 37 mm gun, and the Canso sought cover in the low-lying clouds, after which the boat submerged once more, leaving a moving oil slick that seemed to indicate its course under the water. Marshall then began to home in another aircraft, and Canso "A" 9765 flown by F/O Leech and crew⁵⁸ responded to the call. The decision was made to drop a Mine on the oil slick was eventually made, but due to a miscalculation the unit was dropped some 300 yards short of the aiming point, which

⁵⁷ "U/Boat Attack Assessment Form," Serial 1185, 4 August 1944, PRO AIR 15/138; Franks, Search Find and Kill, 141.

⁵⁸ The crew consisted of F/O C.H. Leech, F/O R.L. James, P/O G.J.C. Mailhot, WO1 G.T. Green, WO2 J.L. Ducharme, WO2 L.T. Nobes, Sgt. A. Korzack, Sgt. A.N. Ragan.

probably placed the weapon too far from the U-boat to acquire its motor noises and home in.⁵⁹ Eleven hours after Marshall's first attack, Liberator P/59 sighted and attacked *U-300* while it was attempting to schnorkel, but failed to inflict any damage. In any case, the submarine's cruise was over. The first attack by F/O Marshall had damaged *U-300* severely enough that it was forced to put back to base to effect repairs. The Type VIIC/41 submarine, under the command of Oberleutnant Fritz Hein, had been on its first patrol, leaving Bergen on 23 July. Arriving in Trondheim on 17 August, repairs took about four weeks, and *U-300* sailed on its next patrol on 3 October.⁶⁰

In the wake of the events of 4 August, 162 (BR) launched a major search in the area of the attack. Three aircraft were dispatched to carry out searches on 4 August, while four more performed the same task on the 5th. Wing Commander Chapman, who was on temporary duty in the UK, returned to Reykjavik on the evening of 5 August. The same day, the sudden demand placed on the squadron's operational capabilities led to the recall of its detachment in Wick. The ORB noted that

⁵⁹ "U 425, U 300 and U 1018 (Including Schnorkel Details Given by Survivors from U 877) - Interrogation of Survivors," N.I.D. 1/PW/REP/21/45, May 1945, 15, DHist 181.009 (D624), vol. 2; "U/Boat Attack Assessment Form," Serial 1185, PRO AIR 15/138; Franks, Search Find and Kill, 141; OC 162(BR) to CO, RCAF Station Dartmouth, NS, "Report on Activities -- S.D. Section, Iceland," 19 February 1945, DHist 181.003 (D3469). While there is conflicting information about the range at which a Mine would home in on a U-boat, and the homing range varied with the depth at which the submarine travelled, the range for a boat travelling at 2 knots is generally given as 200 yards or less, which would place the second Mine attack out of homing range. A/U Ops, "The Mark 24 Mine and Sono-Buoy," 20 May 1944, 1, PRO AIR 15/564. Admiralty tests on HMS *Graph* (the captured *U-570*) apparently gave a homing range of 25 yards when the submarine was travelling at 2 knots, which increased to 480 yards at 4 knots, although the homing range might have been greater if *U-300* was suffering from damage that increased the noise it generated when moving through the water. Coastal Command Development Unit Report No. 44/86, "Trial No. 210 - Functioning Trials of Mark 24 Mine," 12 December 1944, 3, NAC RG 24, vol. 6174, file HQ.19-6-30, vol. 6, "Proctor - EAC". This argument assumes that *U-300* was travelling at a speed of 2 knots, but ocean currents may have produced an oil slick moving with greater or lesser apparent velocity than the submarine itself.

⁶⁰ Catalina A/333 sighted *U-300* on the surface on 15 August, but the submarine dove to a safe depth before an attack could be made. "U 425, U 300 and U 1018 - Interrogation of Survivors," DHist 181.009 (D624); Franks, Search Find and Kill, 141; Air Ministry, "The RAF in Maritime War," V, 59; Hessler, U-Boat War in the Atlantic, III, App. III, 111. The NID interrogation report states that *U-300* returned to Trondheim on 28 August, while "The RAF in Maritime War" and Hessler give the date as 17 August, which seems more reasonable.

the recent flap has been rather a strain on maintenance who have supplied six A/C out of eight available for two days in succession. This show is a credit to our maintenance section. Our serviceable Ops aircraft will decline sharply in number very soon, as most of the aircraft will come up for minor checks together. Our crews are flying up to 17 hours on patrol, getting 8 hours [sic] rest and going out on patrol again. If all our crews and aircraft were at Base [Reykjavik] we would be able to handle the situation with ease.⁶¹

The detachment at Wick was recalled to reinforce mid-Atlantic convoy coverage and patrols in the western part of the Northern Transit Area, as well as to carry out the search for *U-300*. Despite the recall of the detachment, the squadron remained under strength because of the delays caused by sending aircraft to Canada for servicing. An average of just under twelve aircraft were on strength in Iceland and Scotland during August, two thirds of which were serviceable on any given day. This lack of operational aircraft certainly added to 162's difficulties during the search for *U-300*. On 6 August, seven aircraft continued the search, in which units of the Royal Navy were now also participating, and on the following day four took part in the search while four more were used for training or were on local test flights. On this day the last of the detachment returned from Wick as Coastal Command Dakotas flew thirty groundcrew to Reykjavik. Bad weather brought a respite from continuous operations on 8 August, grounding all the aircraft, but four Cansos flew searches the following day, and the effort appears to have continued until 13 August, after which the search was given up. After two and a half months of operations from Reykjavik and Wick, 162 (BR) had returned to operations exclusively from Iceland.⁶²

Even as the search for *U-300* was winding down, training was beginning and the squadron's personnel was being introduced to new equipment. The first was the "AN/CRT-1 expendable radio sonobuoy" (RSB), while the second was the improved forward firing armament for its Cansos. Sonobuoys were intended for use with the Mark 24 Mine and consisted of an omnidirectional hydrophone attached to a small radio transmitter which was dropped into the sea. The sonobuoy which transmitted the sounds

⁶¹ 162 (BR) ORB, 5-6 August 1944.

⁶² Air Ministry, "The RAF in Maritime War," V, 58; 162 (BR) ORB, 6-13 August 1944, summary for August 1944, Appendix D, "Monthly Maintenance Report - August".

picked up by the hydrophone to a receiver carried in an aircraft. Powered by batteries, the sonobuoy had an endurance of about six to ten hours, after which it sank to avoid falling into enemy hands. The hydrophone, suspended about twenty feet below the surface, could pick up noises made by submarines at ranges of up to three miles, but its maximum range depended on numerous variables, including the noise created by wind and waves. Sonobuoys allowed aircraft to determine the approximate speed of the submarine, the detonation of any weapons used against it, and whether or not any decoys or unusual tactics were being used by the submarine. By allowing contact with a submerged U-boat to be sustained, attacks with the Mark 24 Mine could be made much later after a submarine's submergence than would be possible with aircraft not carrying sonobuoys, since the approximate position of the boat could be determined and a Mine could be dropped close enough to the target to home in on it. Although it suffered from limitations, the sonobuoy now allowed aircraft to carry out searches below the water's surface.⁶³

The maintenance of sonobuoys and "Proctor" (the Mark 24 Mine), and training in their use were both the responsibility of the Secret Devices (SD) Section in Reykjavik.⁶⁴ When 162 began to carry Proctor the maintenance party for the weapons was provided by the RAF, but the posting of the British maintenance party to the United Kingdom resulted in the RCAF crew taking over their responsibilities on 28 July.⁶⁵ The Canadian crew had in fact arrived on 1 June, but the RAF officer who had requested their posting had himself

⁶³ F/O C.I. Soucy to D/AMAS-OPS, "Technical Appendix to Report of F/O C.I. Soucy's Visit June 13 to June 17 to U.S. Navy, Washington, D.C.," 22 June 1943, NAC RG 24 vol. 6173, file HQ.19-6-30, vol. 1, "Proctor - EAC". The sonobuoys did not allow accurate tracking of a submerged target, even when several were used, but a pattern of buoys might allow the probable position of a target to be determined. For more information on the AN/CRT-1 sonobuoy, see Appendix C.

⁶⁴ "Secret Devices" was a codename applied both to the Mark 24 Mine and the sonobuoy.

⁶⁵ During early discussions, the RCAF was advised by Coastal Command that a Canadian maintenance party would have to be provided beginning in July 1944. ROYCANAIRF to AFHQ, signal CX.2213, 12 February 1944; NAC RG 24, vol. 6173, file HQ.19-6-30 vol. 2, "Proctor - EAC"; "Report of Trip to 162 Squadron, Reykjavik, Iceland," 30 August 1944, 2, DHist 181.002 (D481). For correspondence relating to the formation of the maintenance party and its dispatch to Iceland, see NAC RG 24, vol. 6173, file HQ.19-6-30, vol. 3, and DHist 181.003 (D2441).

been posted, and no correspondence concerning their posting could be found. As a result, nobody at the base knew what the crew's duties were and they were not admitted to the SD shop because of security regulations. Not until 19 July did the party carry out any SD work, when they began to install recently arrived sonobuoy equipment in the squadron's Cansos.⁶⁶ Interestingly, both Coastal Command and Eastern Air Command shipped sonobuoys and receivers to 162, although most of the former were returned at the request of Coastal Command after the EAC equipment arrived.

The decisions that led to the squadron being outfitted with sonobuoys are not as easily identifiable as those that led to its being equipped with Proctor in March 1944 (which are explicitly stated in the records). Coastal Command and Eastern Air Command policy about the equipping of aircraft with sonobuoys, however, provides a likely answer. As discussed in Chapter 5, Area Combined Headquarters in Reykjavik had suggested in March of 1944 that 162's Cansos carry sonobuoys and the related equipment, but the suggestion may have taken some time to implement. Furthermore, by early July of 1944, all of Coastal Command's squadrons that were equipped to carry the Mark 24 Mine were also equipped with sonobuoys, so there may have been suggestions that 162 should conform with this standard. Finally, at this time Eastern Air Command was equipping its BR squadrons with sonobuoy equipment to be used in conjunction with Proctor. Since the squadron was under the operational control of Coastal Command and followed its doctrine about the use of Proctor and sonobuoys, it is likely that the first two reasons were more influential, although EAC's responsibility for providing spares and equipment for the squadron probably also played a role in this decision.⁶⁷

⁶⁶ While it may seem unusual to allow the Canadian crew to work on sonobuoys but not on Proctor, this situation was possible because Proctor carried a "Top Secret" clearance, while sonobuoys carried a lower "Secret" or "Confidential" clearance. "Report of Trip to 162 Squadron," 1-2, DHist 181.002 (D481).

⁶⁷ Some of the RSB kits shipped to the squadron from Canada were incomplete, but these omissions were soon rectified. "Report of Trip to 162 Squadron, Reykjavik, Iceland, Section B - Radio Sonic Buoys," 30 August 1944, 1, DHist 181.002 (D481); 162 (BR) ORB, 20 March 1944; Minute from A/U Ops to CSO, "Sono Buoy Equipment," 12 July 1944, PRO AIR 15/564; OC

Arrangements were finally made to allow some of the Canadians into the RAF SD section for familiarization in case the latter were posted, which occurred on 28 July. The new maintenance crew was now responsible for briefing and training aircrew on Proctor and RSB equipment in addition to maintaining the homing torpedoes and installing the RSB equipment in 162's Cansos, as well as in any RAF aircraft on the base. No loadings of Proctor were made before 1 August, but they must have begun shortly thereafter, since both Cansos that attacked *U-300* on 4 August were using the weapon.⁶⁸ While aircrew training for Proctor took the form of briefings, largely because no training with the weapon other than practicing the correct airspeed, altitude, and aiming points for dropping was possible,⁶⁹ sonobuoy training was more comprehensive. In addition to briefings delivered by the two officers of the Secret Devices Section, training flights were possible once several aircraft had been fitted with the appropriate receiver. Training began in earnest in early August, with four flights a day taking place, and by 25 August all thirteen aircraft in Reykjavik had been equipped with RSB equipment and the thirteen crews on the station had been briefed and had carried out flight training with the equipment, with a motorboat providing the necessary moving sound target. The practice would not pay off operationally until November, when sonobuoys were used in two attacks by the squadron.⁷⁰

Project "Z", Newfoundland, to AOC, "Policy - Operational Use of Project 'Z' Equipment," 17 May 1944, 2, DHist 181.009 (D3494); "Report of Trip to 162 Squadron, Reykjavik, Iceland. Section A - Proctor," 30 August 1944, 5, DHist 181.002 (D481); "Report of Trip to 162 Squadron, Reykjavik, Iceland. Section B - Radio Sonic Buoys," 30 August 1944, 8-9, DHist 181.002 (D481). The two last-mentioned sources state that, with some minor exceptions, 162 followed Coastal Command doctrine on the two devices.

⁶⁸ "Report of Trip to 162 Squadron," 1-2, DHist 181.002 (D481); OC 162 (BR) to AOCinC EAC, "Policy - Secret Devices Section," 1 August 1944, DHist 181.009 (D1520).

⁶⁹ Practice drops for Proctor could be made using practice bombs, since the two objects had similar trajectories when dropped from aircraft. By April 1945 much of 162's bombing practice was devoted to the correct procedure for dropping Proctor. In order to avoid damage that would cause Proctor to malfunction, strict limits were placed on airspeed and altitude when dropping the weapon. "Suggested Qualifications on 600 lb. DC for Aircrew," 23 January 1945, DHist 181.003 (D442); SD Officer, 162 (BR) to CO, RCAF Station Dartmouth, 1 April 1945, DHist 181.009 (D3492); Coastal Command, "General Instructions for the Operational Use of the Mark 24 Mine," 4, 26 November 1944, DHist 181.002 (D479).

⁷⁰ "Report of Trip to 162 Squadron, Reykjavik, Iceland," 30 August 1944, 1-2; "Report of Trip to 162 Squadron, Reykjavik, Iceland. Section B - Radio Sonic Buoys," 30 August 1944, 6-7. For

While 162's Cansos received their sonobuoy equipment, efforts continued to upgrade the forward-facing armament that had been found lacking during June. Enquiries about various weapon mountings, both real and imagined, used by the United States Navy in its Catalinas were made via the Canadian Joint Staff in Washington, DC and through the USN observer at the Halifax dockyards. The investigations were spurred by the message from 162 in late June that its present installation was "most inadequate" and by a directive from the Chief of the Air Staff following a visit to Eastern Air Command that such an investigation be undertaken to see if the forward firing armament could be improved. The first modification tried was a twin .303 calibre turret modification developed by the USN that was tested on 21 July at Scoudouc by S/L Poag, one of 162's flight commanders, and it worked well enough for EAC to propose that 162's Cansos receive the modification despite some minor problems. "The installation is far superior to the present installation in every respect," the report noted, and "it would certainly be worth while as an interim measure to immediately equip aircraft operating where enemy action may be expected."⁷¹

a complete account of the training procedure, see *ibid.* DHist 181.002 (D481) also contains some of the logs kept by squadron crews undergoing RSB training. A synthetic trainer, which nowadays would be called a simulator, was also under construction, using equipment provided by EAC. The squadron's aircraft in Scoudouc at this time had not yet received the sonobuoy installation, and it appears that much of the equipment would have to be removed from aircraft returning to Scoudouc for servicing due to security considerations. OC 162 (BR) to AOCinC EAC, "Report: Present Status and Future Requirements, S.D. Section, 162 Sqdn," 23 August 1944, DHist 181.009 (D3492). A marginal note on the report of the investigative trip to Iceland suggests that the squadron's sonobuoy training tactics may have been adopted for training with the RN submarine *Unseen* based in Digby, Nova Scotia, which was equipped with a dummy schnorkel and was used largely for RCAF training. Further research in this area would be interesting. "Report of Trip to 162 Squadron, Reykjavik, Iceland," 30 August 1944, 1, DHist 181.002 (D481); Marc Milner, The U-Boat Hunters: The Royal Canadian Navy and the Offensive against Germany's Submarines, (Toronto: University of Toronto Press, 1994), 204.

⁷¹ AOCinC EAC to AFHQ, "Canso - Canso 'A' A/C - Front Gun Armament," 23 August 1944; 162 Squadron to EAC, signal A.80, 24 June 1944, NAC RG 24, vol. 5434, file HQS.457-1-17. vol. 1, "Canso Aircraft: Armament". The power operated turret with quadruple guns referred to in this message did not exist, although enquiries by the Air Member of the CJS in Washington did produce a set of photographs, drawings, and a parts list for a *fixed* four-gun installation used by USN "Black Cats" in the Pacific. Air Member, CJS to AFHQ, "Canso Aircraft - Bow Four .50 Caliber Machine Gun Installation," 17 June 1944, NAC RG 24, vol. 5434, file HQS.457-1-17. vol. 1. The correspondence relating to the provision of new armament for the RCAF's Cansos can be found in this file. Memorandum, AMAS/DOR to AMAE/DAE, 14 July 1944; AOCinC EAC to AFHQ, "Additional Armament for No. 162 Squadron - Canso 'A' Spares," 25 July 1944; AOCinC EAC to

EAC also recommended that the trial installation be left on Canso "A" 11066 so that 162 (BR) could carry out further trials, and that the existing twin guns mounted in the bomb aimer's window in the bow be retained as a fixed gun installation fired by the pilot, since such a mounting would eliminate the ammunition feed problems caused by the flexible mounting currently in use. Reflector sights for both the pilot and the bow gunner were also recommended as a replacement for the existing ring and bead sights so that the guns would be usable at night.⁷²

The new turret was commonly described as an "eyeball" turret, and featured two machine guns mounted in a forward facing plexiglass hemisphere at the front of the turret that allowed a wide range of motion for the weapons. A second hemisphere mounted on top of the turret provided excellent visibility for the gunner and eliminated the sighting problems encountered with the earlier twin-gun mounting in RCAF Cansos.⁷³ The eyeball mounting appeared to be the only immediate solution to 162's armament problems, since a hydraulically operated turret carrying two .50 calibre machine guns recently developed by the USN, which might have been more to the squadron's liking, was not yet in production and in any case would not be available to the RCAF for quite some time. Air Vice Marshal Curtis, the Air Member for Air Staff, was sufficiently impressed with the results of the test of the eyeball turret that he recommended to the Chief of Air Staff that "in view of the ineffectiveness of the present forward armament of our Cansos, the fact that No. 162 Squadron aircraft have been having combats with submarines and the delay in obtaining the power operated .5 in. turret, E.A.C.'s recommendation is concurred in and approval is

AFHQ, "Canso, Canso 'A' - Bow Turret - Report of Eye-Ball Modification and Trials," 3, 25 July 1944, NAC RG 24, vol. 5434, file HQS.457-1-17, vol. 1. The turret did have some problems: some of the seals could not be made watertight for more than rain, and the pilot's forward vision was affected to some extent. For a complete description of the installation, see *ibid.*

⁷² *ibid.*, 4.

⁷³ This description is based on diagrams of the Ryan PB16000 turret, which according to documents was essentially similar to the turret modification under discussion here. Memorandum, D/DArmD for AMAE to AMS/DPA, "Re: Canso Aircraft - Armament - Nose Turret," 11 August 1944, NAC RG 24, vol. 5434, file HQS.457-1-17, vol. 1.

urgently requested.”⁷⁴ A few days later, action was taken to order more of these turret modifications, but inquiries through the CJS in Washington disclosed that only a small number of the modification sets had been produced in Norfolk, Virginia for local use and that no more were available. Fortunately, a similar but improved version had been adopted as standard on all American Catalinas and would be available to the RCAF by 1 September at the latest if an immediate request were made. Interestingly, these turrets were already being installed by Boeing Canada on Catalina aircraft coming off its production line in Vancouver, but the RCAF appears to have been unaware of this equipment until told about it by the Americans.⁷⁵ The decision was soon made in Ottawa that the new turret was an acceptable substitute for the old and “extremely urgent” action was taken to procure the Ryan PB16000 turret for 162 (BR).⁷⁶

In the meantime, Canso 11066, with its new turret and fixed twin-gun installation, returned to Reykjavik, arriving on 11 August. The aircraft underwent further modifications after its arrival, being fitted with sonobuoy equipment and the new LORAN radio navigation aid. The biggest change, however, was the addition of two more fixed guns to its forward firing armament. This modification had been under consideration for some time, since the ORB mentions plans being made by the squadron and records a number of

⁷⁴ Memorandum, AMAS to CAS, “Canso and Canso ‘A’ Aircraft - Improved Forward Armament,” 28 July 1944, NAC RG 24, vol. 5434, file HQS.457-1-17. vol. 1.

⁷⁵ Memorandum, DAE for AMAE to AMS/DPA, “Canso ‘A’ A/C - T.E.O. E.1/40/81 - Manual Twin .303 Gun Nose Turret,” 1 August 1944; CAS to Air Member, CJS, “Re: Canso Aircraft Bow Armament,” 1 August 1944; Memorandum, D/DArmD for AMAE to AMS/DPA, “Re: Canso Aircraft - Armament - Nose Turret,” 11 August 1944; Air Member, CJS, to AFHQ, “PBY-5A Aircraft - Twin .30 Calibre Gun Bow Turret,” 5 August 1944, NAC RG 24, vol. 5434, file HQS.457-1-17. vol. 1.

⁷⁶ Memorandum, D/DArmD for AMAE to AMS/DPA, “Re: Canso Aircraft - Armament - Nose Turret,” 11 August 1944; Memorandum, AMAS (DOR) to AMAS (DPE) through AMAE (DAE), “Canso and Canso ‘A’ Aircraft - Armament - Nose Turret,” 9 August 1944, NAC RG 24, vol. 5434, file HQS.457-1-17. vol. 1. There is some uncertainty in the sources about whether 162 was initially equipped entirely with the Ryan turrets or whether more of the modification sets were actually available from Norfolk, although it appears from later sources that by early 1945 all of the turrets in use were the Ryan PB16000. References to the Norfolk modified turrets may be only to the trial installation in Canso “A” 11066. For correspondence raising this question, see AOCinC EAC to AFHQ, “Armament Policy - Canso Aircraft,” 12 September 1944, AOCinC EAC to AFHQ, “Canso - Canso ‘A’ A/C - Front Gun Armament,” 23 August 1944, NAC RG 24, vol. 5434, file HQS.457-1-17. vol. 1.

consultations with S/L Bannerman, the Station Armament Officer, about the upgrading of the Cansos' forward firing armament. He was of the opinion that four .303 machine guns could not fit in the nose of a Canso due to lack of space, but information provided by the USN about the installation of four fixed .50 calibre machine guns in the nose of some of its Catalinas may have helped the squadron in its decision to install the two additional weapons. The squadron's push for improved armament was also probably supported by the visits of two aircraft to Reykjavik during July. On the 2nd, W/C Chapman and S/L Sully inspected some Soviet Catalinas anchored in Reykjavik harbour. The ORB noted that "these A/C are armed with .5" M.G.'s. Of particular interest is the nose turret [which is] power operated. This is in line with our present line of thought."⁷⁷ Near the end of July, a USN PBY-5A passed through the base, and was also inspected, this time by the OC and the squadron Gunnery and Signals Leaders. This time the ORB noted that it was similar to the squadron's aircraft except for the eyeball nose turret, heated leading wing edges, and a warm air heating system.⁷⁸ At a time when 162 was forced to carry on with its inadequate forward firing armament, the visits of these aircraft must not only have been galling but also an incentive to improve the armament on its Cansos as soon as possible.

⁷⁷ 162 (BR) ORB, 11, 20 August 1944, summary for July 1944, July 1944, Appendix A, "Armament Report," 22, 31, 2 July 1944. Information about the USN's four-gun installation was forwarded to Ottawa by the Canadian Joint Staff on 17 July, but unfortunately there is no evidence definitely proving or disproving that this information was forwarded to 162 (BR), although it would certainly have been useful in planning and installing the fixed four-gun armament. Air Member, CJS to AFHQ, "Canso Aircraft - Bow Four .50 Caliber Machine Gun Installation," 17 July 1944, NAC RG 24, vol. 5434, file HQS.457-1-17. vol. 1. The squadron had also begun to acquire mirror sights for its front guns from the RAF. 162 (BR) ORB, 22 July 1944. The Soviet Catalinas referred to were the PBN Nomad, a modified version of the PBY-5 flying boat, which featured, among other modifications, a retractable power turret in the nose that mounted one .50 calibre gun. Almost the entire production of PBNs was delivered to the USSR by Soviet delivery crews. W. E. Scarborough, PBY Catalina in action, (Carrollton, TX: Squadron/Signal Publications, 1983), 36-37. Unfortunately, there seems to be very little information available about the decisions leading to the installation of the LORAN navigational system in the squadron's Cansos. The RCAF official history records only that inadequate planning led to delays in the installation of such equipment in EAC aircraft. Douglas, The Creation of a National Air Force, 602.

⁷⁸ 162 (BR) ORB, 27 July 1944.

Tests of the new installation were completed on 22 August, and the interim results forwarded to EAC, and from there to RCAF Headquarters in Ottawa. The results were described as

very satisfactory except require reflector sight instead of ring and bead. Twin fixed gun installation [in Canso] 11066 modified to allow four fixed .303 in nose [-] four fixed guns together with twin free guns in eyeball turret very satisfactory installation. Request eyeball turret together with four fixed guns in nose all aircraft this squadron.⁷⁹

The message also informed EAC that the squadron's Gunnery Leader, F/O West, was proceeding to Scoudouc on leave and he would make arrangements about the installation of this improved armament. Another prototype four-gun installation was made at Scoudouc and tested in Canso "A" 9791 on 10 September. The results of the tests revealed a few minor problems that were easily corrected, after which the installation was considered "very satisfactory." On 19 September, RCAF Headquarters gave permission for 4 Repair Depot (RD) at Scoudouc to manufacture the necessary sets of equipment for all of 162's Cansos. By the end of October, all of the aircraft had apparently been fitted with the four fixed guns and the twin gun Ryan turret.⁸⁰ In comparison with the previous twin-gun mounting, the new eyeball turret offered a much larger arc of fire and easier sighting for its machine guns, and the four fixed guns provided a heavy rate of fire for suppressing U-boat flak.⁸¹ With this new installation, 162's aircraft finally had a formidable armament for use

⁷⁹ HQ EAC to RCAF HQ, signal A.462, 23 August 1944, NAC RG 24, vol. 5434, file HQS.457-1-17. vol. 1.

⁸⁰ *ibid.*; HQ EAC to RCAF HQ, "Canso 'A' Aircraft - Front Gun Armament," 21 September 1944; AOCinC EAC to RCAF HQ, "Armament Policy - Canso 'A' Aircraft," 1 November 1944, NAC RG 24, vol. 5434, file HQS.457-1-17. vol. 1. While 162's Cansos were fitted with Ryan turrets and the fixed four gun installation, EAC experienced considerable difficulty in equipping its four other Canso squadrons (5, 116, 160, and 161) with the Ryan turret because RCAF Headquarters in Ottawa believed that the war would soon be over and that the necessary funds could not be obtained. Approval was finally obtained, after having been granted then withdrawn, for the procurement of the equipment on 16 November 1944. For the correspondence and related information on this debate, see NAC RG 24, vol. 5434, file HQS.457-1-17. vol. 1.

⁸¹ The old mounting had provided an arc of fire from 23° to the right and left of centre when depressed 10° below horizontal and an elevation of up to 25° when centred. A modification of this mounting suggested by 162 (BR) (see Chapter 5) increased the traverse to 25° to right and left when depressed to 10° below horizontal and provided an elevation of up to 32° when the guns were centred. The Ryan PB16000 turret rotated 85° to either side of centre, and the eyeball

against surfaced U-boats, but change had come too late. German submarines had stopped fighting back on the surface and were now using the schnorkel, which rendered the improved armament useless. At the time the improved armament was being developed, however, the future pattern of U-boat activity was not readily foreseeable. By the time the modifications to the Cansos' armament was underway, it was no longer really necessary.

While 162 (BR) was improving its equipment and armament and carrying out patrols from Iceland, the pattern of the U-boat war was changing. By the end of July, Group *Mitte*, whose offshore patrol line had been recalled to base, had a strength of 22 U-boats, but throughout August a total of fourteen of the boats were transferred to bases in the Baltic for operations against Soviet naval forces in the Gulf of Finland, and their places were taken by six schnorkel equipped boats. A diminishing number of Type VII and Type IX submarines were entering service as the result of the changeover to production of the new Type XXI and XXIII boats. A few of the larger Type IX had entered service in July, but only one Type VII had entered service during the same time, and this boat, *U-300*, had been forced to return to base following attacks made by 162 (BR) on 4 August. These attacks, as mentioned above, had been 162's last in the Northern Transit Area, but the attack made by F/O Marshall and crew in 9759 had been the only successful attack made in the area during August. Out of a total of eight sightings and six attacks during the month, this had been the only attack that succeeded in inflicting damage on a U-boat (see Appendix E). Eight other boats had passed safely through the area during the month of August, a far cry from the days of June 1944.⁸²

mounting provided an additional 27° of rotation to either side. Maximum depression was 23° and maximum elevation 63°. 162 (BR) ORB, March 1944, Appendix F, "Ammunition Tank Modification for Twin Nose Guns on Canso "A" and Catalina Type Aircraft," 2; Consolidated Vultee, Handbook of Erection and Maintenance Instructions, Navy Model PBV-5 PBV-5A Airplanes, n.d., 635.

⁸² Hessler, The U-Boat War in the Atlantic, III, 80; Air Ministry, "The RAF in Maritime War," V, 59, n.3. The U-boats passing through the transit area had either been assigned to distant overseas operations (i.e. the Caribbean or the Indian Ocean) or were assigned to weather reporting duty in the mid-Atlantic. On average, about three weather boats were on patrol between Greenland and the Azores during the months of June to September 1944. Hessler, The U-Boat War in the Atlantic, III, 80-81.

August also witnessed two dramatic changes in the U-boat war. The first was the initial evacuation of the bases in France, the second the beginning of the inshore U-boat campaign in British waters. Beginning in early August, German forces began to evacuate their northern bases on the Bay of Biscay in the face of Allied advances, moving U-boats to the more southerly ports of La Pallice and Bordeaux. Acting on Enigma decrypts, Allied forces destroyed eleven of the fifteen southward-bound U-boats as well as a considerable amount of shipping. Eight of the eleven U-boats destroyed had not been equipped with schnorkel, a testimonial to the effectiveness of the device. The evacuation of the remainder of the bases was imminent, however: on 18 August the order was given to evacuate all of southern and southwestern France, with the exception of several fortified ports, and all U-boats that could put to sea were ordered to sail for Norway. In order to divert Allied anti-submarine forces and give the evacuating boats a better chance of reaching Norway, eight fully serviceable U-boats were ordered to take up inshore positions in the North Channel and Bristol Channel (see Map 5). These new dispositions were revealed by Enigma decrypts on 26 and 27 August, as was the order to submarines in the English Channel to return to Norway. Decrypts on 28 August also revealed that nine boats had sailed from Group *Mitte* in Norway to take up inshore positions around the northern British Isles and off Reykjavik. Just less than a month later, on 23 September, *U-267* became the last boat to leave the Biscay bases when it sailed from St. Nazaire for Norway. Eighteen submarines made similar northward trips from the bases and of these only one, *U-445*, was lost to Allied action. When the eight U-boats dispatched to operate off the British Isles as a diversionary measure are included, four of twenty-six boats from the Biscay bases were sunk. Beginning on 18 September, these twenty-two boats, along with nine boats that had been operating in the English Channel, began arriving in Norwegian ports.⁸³

⁸³ *ibid.*, 76-80; Tarrant, The Last Year of the Kriegsmarine, 106-111; F.H. Hinsley, British Intelligence in the Second World War: Its Influence on Strategy and Operations, Volume III, Part 2, (London: HMSO, 1988), 463-467; Air Ministry, "The RAF in Maritime War," V, 69-70.

The withdrawal had an immediate and lasting effect on U-boat operations. By moving to U-boat bases further from the open Atlantic, the effective range of the boats was reduced. The destruction of the last of the U-tankers that refuelled and rearmed submarines in the mid-Atlantic and the extension of Allied air cover over the entire ocean that prevented any sort of replenishment at sea also meant that U-boats operating from Norway were limited to the fuel and munitions they could carry when leaving base. "Henceforward," the British official history states,

except for the U-Kreuzers, overseas operations became limited to the coast of North America or N.W. Africa for the Type IX boats. For the smaller Type VII.s there remained only the coastal waters of Iceland and the British Isles.⁸⁴

These limitations were to dictate the nature of the next phase of the U-boat war, the inshore campaign.

Although schnorkel equipped U-boats had been operating in the English Channel and the North Minch and North Channel areas (see Map 5) since June of 1944, the dispatching of boats from French and German bases in mid and late August marked the true beginning of the inshore campaign. As mentioned above, Enigma decrypts on 26, 27, and 28 August revealed that U-boats were bound for inshore patrol areas off the British Isles and Iceland. Peyton-Ward, who like Roskill was unable to refer to Ultra, notes that

the evacuation of the Biscay ports was well under way and some sort of compensatory though temporary action was expected by us from Norwegian based U-boats. Precautionary counter-action by special inshore air patrols was therefore inaugurated as [sic] likely points such as around the Orkneys, off the Butt of Lewis, off Reykjavik in Faxe Bay and of course in the North Channel area.⁸⁵

The last area was described as a "tender spot"; this was where the majority of the Atlantic shipping converged, so heavy air and surface patrols were deployed to protect it against U-

⁸⁴ *ibid.*

⁸⁵ Hinsley, British Intelligence in the Second World War, III, pt. 2, 466; Tarrant, The Last Year of the Kriegsmarine, 155-157; Air Ministry, "The RAF in Maritime War," V, 60-61. Both Peyton-Ward and Tarrant provide breakdowns of the inshore campaign, but in different formats; the former provides detail on each operational area on a month by month basis, while the latter breaks the campaign down into "waves" of U-boats, without necessarily providing details on operational areas where no sinkings or other major events occurred. The sources are more useful when used in conjunction.

boat attack. Despite that, *U-482* managed to sink a large tanker and a British corvette on 30 August and 1 September, and followed up these successes by sinking another freighter on 2 September and two more on the 8th. Evading the surface and air searches, *U-482* returned safely to Norway. This was the first serious assault on the North Channel area since 1940. The redeployment of anti-submarine forces to the inshore areas before and after these attacks and the inshore operations of other U-boats allowed the submarines bound for Norway to reach their objective safely, which had after all been the objective of the new operational pattern.⁸⁶

This new pattern had not been foreseen by Allied intelligence. From late July predictions had been of an autumn resumption of convoy battles in the mid-Atlantic using schnorkel equipped boats that would be joined by an increasing number of the new Type XXI and XXIII U-boats as the year progressed. Although decrypted Japanese signals from Berlin revealed that entry of the new submarine types into service in the fall would not take place, the use of the older schnorkel boats in mid-Atlantic was not discounted. The possibility of an inshore campaign, however, was not foreseen.⁸⁷ Coastal Command's August plans formulated in conjunction with the Admiralty assumed that after suitable reserves for convoy coverage in the Western Approaches were established, the Command's primary task was to interdict the flow of U-boats through the Northern Transit Area, operating in coordination with surface forces. By 7 September, however, Sir Sholto Douglas, AOCinC of Coastal Command, informed the Air Ministry that the unexpected inshore campaign had greatly complicated Coastal Command's task. In addition to intensive operations in the Northern Transit Area, heavy patrolling was required in three other areas: in and around the North Minch, in the approaches to the North Channel, and

⁸⁶ *ibid.*, 81, 62-63, 83. 18 Group had been reinforced during August in anticipation of the loss of the Biscay ports, which would require all U-boats to operate from Norwegian ports and hence pass through the Northern Transit Area. Hinsley, British Intelligence in the Second World War, III, pt. 2, 468. See "The RAF in Maritime War," V, 58-59 for a description of the reinforcements and their operations during August.

⁸⁷ Hinsley, British Intelligence in the Second World War, III, pt. 2, 474-475, 467.

in the approaches to the Bristol and St. George's Channels.⁸⁸ The resultant directive issued on 11 September relegated the offensive in the Northern Transit Area to secondary importance, both because of the belief that patrols around convoys was more efficient than operations against transit areas and because of the difficulty of mounting an effective campaign of interdiction in the waters north of the British Isles.⁸⁹

The predictions of a return to mid-Atlantic convoy battles had a direct effect on 162's operations. In fact, the recall of its detachment from Wick to Reykjavik on 6 August was intended to reinforce convoy coverage in the Atlantic as well as carry out operations in the western part of the Northern Transit Area. The Enigma decrypts mentioned above that revealed the beginning of the inshore campaign, however, also led to the establishment on 26 August of local air patrols in Faxse Bay, the approaches to Reykjavik harbour, by 162's Cansos and the station's flight of Avro Ansons.⁹⁰ An unexplained visit by a senior Coastal Command officer and the CO of the RAF station on 28 August may also have been connected with the decrypts, since beginning on 30 August, the Senior Air Staff Officer (SASO) at Reykjavik called on 162 (BR) to carry out as many patrols as possible, and the ORB at one point referred to the situation as "the present flap" without explaining its cause. Unfortunately for the squadron, many of its aircraft were away in Scoudouc for servicing and heavy loads were imposed on the crews and aircraft remaining in Reykjavik. Of ten available aircraft, two were grounded for a lack of parts, and by 4 September all patrols

⁸⁸ Air Ministry, "The RAF in Maritime War," V, 81.

⁸⁹ S.W. Roskill, The War at Sea, 1939-1945: Volume III: The Offensive, Part II: 1st June 1944-14th August 1945, (London: HMSO, 1961), 177. The schnorkel was not the only problem that an air offensive in the Northern Transit Area would face. The amount of daylight in the area was decreasing, and rough seas promised to render ASV completely useless for the detection of schnorkels. The area that had to be covered was also much larger than the Bay of Biscay, where such offensives had been tried in the past. Air Ministry, "The RAF in Maritime War," V, 82. Ultra provided real information to back up these concerns. Decrypts demonstrated the declining effectiveness of Coastal Command patrols in the Northern Transit Area. Hinsley, British Intelligence in the Second World War, III, pt. 2, 467-468.

⁹⁰ Air Ministry, "The RAF in Maritime War," V, 58, 62. Reykjavik was not the only area in which Ansons were used in the anti-U-boat role during the inshore campaign. Patrols in the North Minch and Moray Firth areas were flown by Ansons of 1693 Squadron, and on 27 August one of them made an unsuccessful attack on U-296 in the former area. *ibid.*, 61-62.

were called off for forty hours due to aircraft unserviceability and aircrew exhaustion. Several signals were sent to Eastern Air Command advising that the squadron was unable to meet its operational requirements, but apparently no reply was received from EAC. The length of time taken to service aircraft at Scoudouc became a major concern, as some aircraft and crews were away for over eight weeks, and one crew did not return with an aircraft for over two and a half months. Although two Cansos arrived in the latter part of September, the squadron's aircraft situation remained serious.⁹¹

While attempting to deal with its shortage of aircraft, the squadron faced the additional complication of a change of command. On 3 September a signal was received posting Wing Commander Chapman to Ottawa. He was "not pleased, as there is a lot of unfinished work to be done here." The ORB noted that "the Squadron as a whole will be very sorry to see him leave. He has done an excellent job, both as Officer Commanding of the Squadron and pilot of a Canso. He has worked hard at his flying duties and at his desk. Never complaining and always thinking of the men under his command."⁹² Command of 162 (BR) was handed over to Squadron Leader W.F. Poag at a muster parade in the camp theatre two days later, where after some brief speeches three cheers were given for the departing OC.⁹³

The new inshore aircraft patrols were started just in time; *U-244*, which had left Norway on 23 August, arrived off Reykjavik on the 29th and remained on station until 21 September. Only two small convoys and a single ship were sighted during its patrol. At one point, the boat lay four miles northwest of Reykjavik for twelve consecutive days, during which time no shipping was sighted. The inshore fishery in Faxse Bay caused the crew some annoyance, since the presence of a large number of small craft was an added

⁹¹ 162 (BR) ORB, 28, 30 August 1944, 1-5, 18, 22, 25 September 1944, summaries and maintenance reports for August and September 1944.

⁹² *ibid.*, 3 September 1944.

⁹³ *ibid.*, 5 September 1944. Kostenuk and Griffin give the date of change of command as 4 September. Kostenuk and Griffin, RCAF Squadron Histories and Aircraft, 68.

complication to the submarine's nighttime schnorkelling.⁹⁴ *U-244*'s relief arrived on 21 September, when *U-979* entered the waters off Reykjavik. The following day the boat torpedoed and damaged the American freighter S.S. *Yukon* (5,970 tons) six miles off Reykjavik. Close air escort was being provided by Liberator C/53, but the aircraft did not sight the torpedo or the U-boat prior to the attack, and failed to make any sighting during the subsequent search. The hunt by surface craft also failed to sink or even damage *U-979*, although a collision with a surface craft shortly after the torpedo attack damaged the boat's main periscope, and on 26 September, having avoided further Allied searches, *U-979* set course for Norway since the damaged periscope could not be repaired.

Interestingly, although 162's Cansos were almost certainly involved in the search, no mention of it or of the sinking that precipitated it can be found in the squadron's ORB.⁹⁵

The experience of *U-979* on its patrol was typical of U-boats operating inshore. Schnorkelling only for brief periods at night, they had to wait for targets of opportunity, since surface mobility and searches were denied them by air patrols. These patrols could be avoided during the day by constant submergence or careful use of the periscope, and the radar search receiver on the schnorkel head warned of the near approach of aircraft or ships using radar. Air patrols might keep the U-boat submerged at all times, but constant submergence meant that the aircraft was no longer the effective killer of U-boats it once had been. Surface ships also experienced considerable difficulty in locating U-boats operating inshore. Locating a U-boat lying on the bottom in shallow water was a difficult undertaking, and currents, temperature gradients, and in some areas fresh water entering

⁹⁴ Tarrant, *The Last Year of the Kriegsmarine*, 155; Hessler, *The U-Boat War in the Atlantic*, III, app. III, 110; Air Ministry, "The RAF in Maritime War," V, 62, 87. In order to avoid detection, U-boats on passage and in their patrol areas usually schnorkelled at night. *ibid.*, app. V, 1-2.

⁹⁵ 53 Squadron had also begun to provide air cover off Iceland. Most of the flying consisted of close air escort to convoys in the approaches to Reykjavik rather than general patrols in the inshore areas. *ibid.*, 87-88.

the ocean vastly complicated the task of ships hunting submarines.⁹⁶ Peyton-Ward observed that

. . . the aircraft had descended from its exalted position of U-boat Killer No.1 to the humble yet useful role of scarecrow to ensure the continual submergence of U-boats while at sea and consequent lack of mobility. . . . U-boats by the end of 1944 had become almost immune from detection or attack while on passage to and from the Atlantic or the British Isles. When they reached their inshore operating areas they could exist for lengthy periods without molestation *as long as they committed no hostile act*. Once they hit a target, it provided a known datum point for an immediate retributive surface craft hunt.⁹⁷

The hunt that followed *U-979*'s attack would not be the last such effort in the waters off Reykjavik in 1944.

Shortly after *U-979* had begun its unscheduled return to Norway, another U-boat left for Icelandic waters. In a twist of fate, *162 (BR)* had already encountered this boat, but this time the U-boat and not the aircraft would succeed. On 4 October, *U-300* left Norway, arriving in its operational area on 22 October. This was one of only eleven boats to leave Norwegian bases during October, largely because of the reorganization taking place at the Norwegian bases. After the loss of the French bases, Norwegian ports were the only front-line bases for Atlantic operations, and were inadequate to the task of supporting the entire fleet of submarines, especially since adequate refitting facilities existed only at Trondheim and Bergen, and in neither port were additional bomb proof shelters for the U-boats complete. As a result, most of the Type IX and some of the Type VII submarines had to operate from German bases, making a staging stop at Kristiansand. This process increased the amount of time spent on transit and thus decreased the operational effectiveness of the German submarine fleet. To add to German difficulties, two Bomber

⁹⁶ For a discussion of the problems faced by surface ships during the inshore campaign, see Marc Milner, "The Dawn of Modern Anti-Submarine Warfare: Allied responses to the U-Boats, 1944-45," *RUSI Journal*, 134:1 (Spring 1989), 61-68, and for more detail from a Canadian perspective, Milner, *The U-Boat Hunters*, ch. 4-6. Tarrant, *The Last Year of the Kriegsmarine*, 155-207, and Air Ministry, "The RAF in Maritime War," V, passim, also discuss the inshore campaign in some detail. The last source is probably the best discussion of the effect of the inshore campaign on air operations.

⁹⁷ Air Ministry, "The RAF in Maritime War," V, 109.

Command raids on Norwegian bases during October destroyed four U-boats and damaged the port facilities necessary to support submarine operations. Even before the raids the length of time necessary to service U-boats led to a reduction in the number of serviceable boats and in the proportion of its time that a boat could spend on operations. Reserves had been drawn down by the September inshore offensive and some of the older U-boats that had escaped from France were being sent back to Germany for decommissioning and their crews drafted to man the new Type XXI and XXIII submarines then coming off the assembly lines. The limitations imposed by Norwegian bases and the problems encountered in trying to improve them meant that the lull in inshore operations continued until November, when another wave of U-boats left for patrol areas around the British Isles. Because of the slow passages to operational areas enforced by use of the schnorkel, most of the U-boats did not arrive in their operational areas until December.⁹⁸

After arriving in Icelandic waters on 22 October, *U-300* lay mostly off the lighthouse at Skagi, on the end of the Reykjanes peninsula (see Map 3), taking bearings on mountain peaks and the lighthouse through its periscope. The only sightings made by the submarine until 10 November were small ships and coastal fishing boats. On that date, *U-300* was in position to attack the ships of convoy UR 142, which had been scattered by a gale and which was not receiving air escort. The first ship hit was the British tanker *Shirvan*, of 6,017 tons, which was proceeding ahead of the convoy. The Icelandic ship *Godafoss* (1,542 tons) reached the stricken tanker some two hours later and rescued its crew, but was herself torpedoed by the U-boat and sank within four minutes, taking twenty-four Icelandic nationals along with her.⁹⁹ The British tug *Empire World* (269 tons) was *U-300*'s final victim.¹⁰⁰

⁹⁸ Air Ministry, "The RAF in Maritime War," V, 82, 92-93, 191; Tarrant, The Last Year of the Kriegsmarine, 156-160, 164-167; Hessler, U-Boat War in the Atlantic, III, 88; Roskill, The War at Sea, III, pt. 2, 182-183.

⁹⁹ 162's ORB noted that the sinking of the *Godafoss* had "caused a very bitter feeling towards the Nazis. The local press are very outspoken in condemnation of this act of brutality." Ten passengers and fourteen crew were lost in the sinking. Among them was a family of five,

No air cover was provided for the ships of UR 142 at the time of the attack, probably because of the poor weather and the scattered convoy. On the night of the 9th/10th, one of 162's Cansos was unable to locate the crew of a Hudson which had come down about sixty miles south of the base because of the deteriorating weather. During the night, winds reached eighty miles per hour, and high winds continued throughout the 10th. One Canso had been up for a brief test flight early in the afternoon, but none were on operations until the tanker signalled that it was being attacked, at which point Canso "A" 11091 was sent up to provide coverage. During its two and a half hour patrol no sighting of *U-300* was made, and no subsequent air patrols turned up any trace of the submarine. Despite the searches, *U-300* remained off Reykjavik until 22 November, when she began her return trip to Stavanger, reaching port on 4 December. In the wake of these attacks, all convoys and many of the single ships operating near Reykjavik were given air cover, and day and night patrols were also increased. The next U-boat bound for Icelandic waters arrived on 27 November; it was *U-979* again, but the boat's second mission was less successful than her first. Although she was not detected by Allied air patrols, no ships were attacked or sunk before she left the area on 29 December.¹⁰¹

consisting of two young doctors returning from Harvard and their three children. Four or five of the nineteen crew rescued from the *Shirvan* also survived the sinking of the *Godafoss*. 162 (BR) ORB, 10 November 1944; Gudmundur Helgason, "History of Iceland and World War Two," 24 October 1996, <http://islandia.nominus.com/history/WWII.html>.

¹⁰⁰ Tarrant, *The Last Year of the Kriegsmarine*, 156, 160; Air Ministry, "The RAF in Maritime War," V, 106; "U 425, U 300 and U 1018 (Including Schnorkel Details Given by Survivors from U 877) - Interrogation of Survivors," N.I.D. 1/PW/REP/21/45, May 1945, 16, DHist 181.009 (D624), vol. 2; Jürgen Rohwer, *Axis Submarine Successes, 1939-1945*, (Annapolis: Naval Institute Press, 1983), 177. Interestingly, there is no mention of the sinking of the tug by *U-300*'s survivors in the interrogation documents. Both LUT (pattern running) torpedoes and the T-5 acoustic homing torpedoes were fired by *U-300* at the first two ships, but the T-5s apparently missed. It is quite possible, therefore, that the tug was sunk by the T-5 intended for the *Godafoss*. No report of this attack was submitted by the U-boat, so the crew were probably unaware of their success, attributing the explosion to an end of run detonation of the T-5, which was a common occurrence.

¹⁰¹ Although no sightings of *U-300* appear to have been made, her crew reported that they had intercepted an aircraft sighting report and that one or two Asdic sweeps were heard. "U 425, U 300 and U 1018 - Interrogation of Survivors," 16; 162 (BR) ORB, 9-10 November, 1944; Air Ministry, "The RAF in Maritime War," V, 106. The lost Hudson probably belonged to 251 Squadron, the Meteorological Flight based at Reykjavik. Air Ministry, "The RAF in Maritime War," V, app. 1, "Order of Battle - Strength and Availability, 1st November, 1944," 14.

While 162 had no success in locating *U-300* operating inshore, its Cansos appeared to have had some luck with locating schnorkelling U-boats at sea. On 3 November, Canso "A" 11090, flown by F/L D.J. Orr and crew,¹⁰² while flying through snow showers some 200 miles south of Reykjavik, sighted a pronounced wake with a vapour cloud at the head moving downwind. No contact was picked up on the aircraft's ASV Mark II. The target disappeared into a snow shower, then reappeared, only to vanish in another shower. Sonobuoys were dropped, giving what appeared to be evidence of a submerged U-boat, and an attack was made with a Mark 24 Mine without result.¹⁰³

Two days later, another crew¹⁰⁴ in Canso 11090 made another sighting in the same area. Flying through snow showers, P/O M.A. Palmer, the pilot, sighted an "unusual movement" some five miles away with binoculars, and the aircraft altered course to investigate. All of the crew could see some form of movement in the water, and as the aircraft approached, the engineer, using binoculars from the port blister, saw what seemed to be a barrel-shaped object. He pointed it out to the navigator, who thought that an object was within the vapour but could not be clearly seen. At a distance of less than a mile, a vapour cloud was seen at the head of a wake some 100 yards long, heading in roughly the same direction as the Canso at about five knots. P/O Palmer threw the aircraft into a sharp turn to port and came around to attack the object from its port side, releasing three Mark XI depth charges spaced at eighty feet. The exploding depth charges straddled the wake but unfortunately were some 200 feet from the disturbance, which would have placed them 100 feet behind a schnorkelling U-boat's stern, and the wake continued to advance. The Canso

¹⁰² The crew consisted of F/L D.J. Orr, captain, F/L P.J. Presidente, co-captain, F/O G.E. Oliver, navigator, F/L J.P. Field, P/O A.A. Drackley, WO2 H.R. Westgarth, F/S D.E. Cousins, and F/S D.R. Spencer. It is not entirely clear if they were flying Canso 11090 or 11066 during this mission, since the squadron records describe it as the latter, while other sources suggest it was the former.

¹⁰³ 162 (BR) ORB, 3 November 1944; Air Ministry, "The RAF in Maritime War," V, App. VI, 4.

¹⁰⁴ The crew consisted of P/O M.A. Palmer, pilot, F/S D. Silver, co-pilot, F/O L.G. Peterson, navigator, WO1 J.A. Honour, P/O D.G. McLean, WO1 S.J. Burwood, Sgt. J.H. Girard, and Sgt. A. Korzack.

dropped a marine marker at the point of the attack and circled, but observed no signs of damage. Shortly thereafter Canso "A" 9755 arrived and dropped a sonobuoy. Radio Telephone (R/T) contact was established with 11090, and it became apparent that nothing was being detected by the sonobuoy. Shortly thereafter, at 1657 hours, 11090 began to lay a pattern of sonobuoys, but the rough seas made the fluorescent markers used to mark the locations of the sonobuoys invisible, so marine markers were used instead. At first only the usual sea noises were heard, but after about an hour three of the crew heard a "faint whirring" on one of the buoys. The navigator and one of the WAGs thought it sounded like a U-boat's motors heard at a great distance, but there were no more buoys, so the sound could not be localized. At about 1900 hours the buoys had died out, so 11090 flew a search around the site of the attack until Liberator C/53 arrived some three hours later to relieve the Canso. Captain D.V. Peyton-Ward, the Naval Staff Officer at Coastal Command Headquarters, assessed the sighting and attack as "an excellent binocular lookout. The evidence supported by photographs confirms the presence of a U/B schnorkelling."¹⁰⁵

The final sighting in November occurred almost three weeks later, and once again Canso 11090 was involved. On 23 November, a moving wake was sighted ten miles away in position 62° 47' N, 21° 58' W following a southerly course. F/L B.F. Hunter, the pilot, brought the aircraft closer to investigate, but as it approached the movement stopped, and by the time the Canso reached the approximate location of the wake there was no disturbance left on the surface to provide an aiming mark.¹⁰⁶ As this sighting and the two attacks were the first since early August, the squadron's ORB was fairly upbeat. "Three

¹⁰⁵ 162 (BR) ORB, 5 November 1944; "Sighted with Binoculars," Coastal Command Review, 3:12 (December 1944), 8, DHist 181.003 (D963); Air Ministry, "The RAF in Maritime War," V, App. VI, 4; "U/Boat Attack Assessment Form," Serial 1213, PRO AIR 15/138.

¹⁰⁶ Air Ministry, "The RAF in Maritime War," V, App. VI, 6; 162 (BR) ORB, 23 November 1944, summary for November 1944. The crew consisted of F/L B.F. Hunter, P/O T.G. LaPlante, F/O J.R. Muzeen, WO1 G.R. McMacken, WO2 E.N.C. Tilander, F/S W.H. McGowan, Sgt. E.S. Hill, and Sgt. T.E. Hooson. Curiously, there is no mention of this sighting in the ORB in the entry for 23 November, but the summary for the month refers to it.

probable U/Boat sightings were made,” it recorded, “but unfortunately no attacks with definite results were obtained. However the three sightings give the Squadron a high average and as they were all visual, it shows results in the training and efficiency of the crews.”¹⁰⁷ While the sightings did demonstrate the effectiveness of the crews, no definite results could have been obtained from the two attacks in any case, because no U-boats were anywhere in their vicinity, and the authenticity of the sighting on 23 November was extremely doubtful. The phenomena that 162’s crews had mistakenly identified as schnorkelling U-boats were in fact willywaws, small surface whirlwinds that were sucking up spray and attempting to become waterspouts. Willywaws had been sighted before U-boats were equipped with schnorkels and were dismissed as meteorological curiosities at the time, but by September 1944 these sightings had been forgotten, and as the effectiveness of the aircraft as an anti-submarine weapon waned, air crews began to report willywaws and other natural events as schnorkelling U-boats. Only a few such reports, unaccompanied by photographs, were made in September, but the sightings were assumed to be of schnorkelling U-boats.¹⁰⁸

Canso 11090’s sighting and attack on the 5th was recorded with a series of good photographs, one of which was published in the December issue of *Coastal Command Review* accompanied by a description of the attack, which stated that the photographs “confirm the presence of a Schnorkelling U-Boat.”¹⁰⁹ These photographs were in fact

¹⁰⁷ 162 (BR) ORB, summary for November 1944.

¹⁰⁸ Air Ministry, “The RAF in Maritime War,” V, 97-98. One of the first attacks made on a natural phenomenon in September 1944 was by Sunderland D/423 (RCAF), which attacked what was either a whale spout or a wake left by a collapsing waterspout on the 11th. Admiralty Intelligence discovered several months later that *U-484* had disappeared in this area at about this time, and the destruction of this boat was credited to either this attack or an attack carried out by HMCS *Dunver* and *Hespeler* on 9 September. Investigative work in 1955 apparently clarified the situation and credited its sinking to the ships, but some controversy still surrounds the attack. See Air Ministry, “The RAF in Maritime War,” V, 84; Brereton Greenhous, Stephen J. Harris, William C. Johnston, and William G.P. Rawling, The Crucible of War, 1939-1945: The Official History of the Royal Canadian Air Force, Volume III, (Toronto: University of Toronto Press, 1994), 414, and Milner, The U-Boat Hunters, 189-190, for details.

¹⁰⁹ Air Ministry, “The RAF in Maritime War,” V, 98; “Sighted with Binoculars,” and Plate 1, Coastal Command Review, 3:12 (December 1944), 8, DHist 181.003 (D963).

similar to earlier photographs of willywaws, and very different from the very few genuine pictures of schnorkels that were taken. Their non-submarine nature was confirmed after the war, when examination of German records revealed that the closest U-boat to the attacks on 3 and 5 November was *U-396*, which was 225 and 250 miles away respectively to the northeast. The sighting on 23 November might actually have been of *U-300*, which was in roughly the same area on this date, but the distance at which the wake was sighted and its description suggest that it was in fact a willywaw.¹¹⁰

While 162's sightings were made in the western part of the Northern Transit Area, other such sightings were soon made in the waters to the north of Ireland, and were accepted as genuine. Peyton-Ward notes that

Although it is easy to criticise, with postwar research and German records available, it does seem odd that suspicion of genuineness was not aroused by some of the above points. Actually a wave of optimism spread, the seas were eagerly scanned for similar objects and attacks on willywaws continued Selected photographs of the so-called schnorchelling U-boats were published in the Coastal Command Review for December and the "white smoke" type of sighting was accepted as authentic. Such bogus reports continued up to the end of the year and included several cases which were far more likely to have been puffs from a spouting whale
. . . The acceptance of the numerous bogus sightings had the unfortunate result that aircrews grew to believe that any kind of smoke or vapour near the surface of the sea, even if sighted ten or fifteen miles away, was probably emitted by a schnorchelling U-boat.¹¹¹

¹¹⁰ Air Ministry, "The RAF in Maritime War," V, 98, app. VI, 6.

¹¹¹ *ibid.*, 99-100. Actually, suspicions that some of the sightings were caused by natural phenomena or other non-submarine objects resulted in some sightings in 1945 being classified as "non-submarine" by Coastal Command Headquarters, but most of the sightings were classified as genuine. The suggestion that willywaws and waterspouts might be responsible for some of the sightings was dismissed as late as March 1945 when Coastal Command information about the use of the schnorkel stated that "suggestions have been made that some sightings reported as Schnorkel clouds were in fact sightings of incipient water spouts. It is considered that very few, if any, of the Schnorkel clouds could have been waterspouts since prior to the advent of the Schnorkel, very few waterspouts have been seen in the areas where the new type of target is being reported." This statement assumed that willywaws and waterspouts would have been noted and reported by aircrew prior to the beginnings of the false sightings, but they were probably ignored because at the time they were of no significance in the hunt for U-boats. Headquarters, Coastal Command, "Details of the Enemy's Use of Schnorkel," 12 March 1945, PRO AIR 15/461; Air Ministry, "The RAF in Maritime War," V, app. V, 1. To add to the confusion, U-boat prisoners of war identified photographs apparently identified photographs of willywaws as being "characteristic of a schnorkelling U-boat", either because of limited experience with the appearance of a schnorkelling U-boat, having only seen boats undergoing schnorkel training, or

In fact by autumn 1944 schnorkelling had become a highly developed technique, and since the U-boat would keep a constant periscope watch on the schnorkel's exhaust while schnorkelling, the large clouds of "white smoke" characteristic of the willywaws would never be produced by a schnorkelling U-boat. Emissions from a schnorkelling U-boat would be limited, and although they might be visible to an aircraft at short ranges on a calm sea, centimetric radar would offer a better detection range against the schnorkel head than would visual search under such circumstances. Although heavier weather would prevent detection by centimetric radar, the wind would also disperse any exhaust and render visual detection virtually impossible even at very close ranges. In the case of 162's sightings in November, the relation between visual sightings and radar contacts was moot, since the obsolete ASV Mark II carried by its Cansos was incapable of detecting a schnorkel under any conditions. Finally, the daylight sightings were inconsistent with actual U-boat schnorkelling doctrine. Postwar examination of records established that the boats spent little or no time schnorkelling during daylight hours while in their patrol areas, and rarely used the schnorkel during daylight hours while in transit. Most schnorkelling was carried out at night for short periods of time, and was almost never carried out in a downwind direction due to problems with depthkeeping and the aspiration of exhaust fumes by the air intake. In any case, 162 (BR) had not been alone in its spurious sightings. During November 1944 fourteen bogus sightings had led to nine attacks, while only five genuine sightings and three attacks were made. These false sightings had become part of the war against the U-boat and would continue for the remainder of the war.¹¹²

As experience was gained with inshore U-boat operations the pattern of activity by Coastal Command changed. In September, it had taken the form of heavy air patrols in suspected U-boat operational areas without much close escort being supplied to convoys.

because of a desire to deceive Allied interrogators. "Information on Schnorkel Supplied by Prisoners of War," 12 March 1945, PRO AIR 15/461.

¹¹² Air Ministry, "The RAF in Maritime War," V, app. V, 1, app. VI, 1.

By the end of October, however, more close escort was being supplied, especially by 15 and 19 Groups, which bore most of the responsibility for covering the Atlantic convoys since more of them were now arriving via the South-Western Approaches to the British Isles. While within two days' sailing from British ports, convoys considered to be endangered were supplied with patrols ahead of and to either side of the convoy's track. Unfortunately, this plan required almost all of the 244 available aircraft in the two groups, and it depended on intelligence, most notably Enigma decrypts, to function. The new solitary operating patterns of the U-boats, the recently introduced radio silence by U-boats and BdU, and the introduction of new Enigma ciphers in December 1944 would strain the ability of the Admiralty's U-boat Tracking Room to plot the locations of U-boats on patrol.¹¹³

As November changed to December the squadron witnessed another change in command. On 12 November W/C Poag and F/L Buchanan were recalled to Canada for interviews with Trans-Canada Airlines (TCA) officials. Squadron Leader J.K. Sully assumed temporary command during Poag's absence, but on 29 November W/C Poag relinquished command, and S/L Sully was appointed Officer Commanding effective the following day, making him the squadron's third commander in just under three months. These changes appear to be the result of the gradual return of aircrew to Canada as their tours expired and new aircrew arrived to replace them. The ORB noted that by the end of November "the squadron aircrew strength has nearly completely changed from the aircrew posted with the squadron to Iceland."¹¹⁴ Other aircrew would continue to be repatriated throughout December, but the issue of groundcrew tours of duty remained unresolved almost a year after the squadron's arrival in Iceland.

¹¹³ *ibid.*, 82, 94; Roskill, The War At Sea, III, pt. 2, 181; Tarrant, The Last Year of the Kriegsmarine, 163.

¹¹⁴ 162 (BR) ORB, 12, 15 November 1944, Summary for November 1944.

With one exception December was an unremarkable period in the squadron's operations. No sightings, real or otherwise, were made, but tragedy struck on the 19th when Canso 11061, carrying F/L E.P. Oakford and crew,¹¹⁵ failed to return from its patrol. A Liberator from 53 Squadron was sent out on a search but worsening weather forced it to return to base after six hours. The following day ground parties and two aircraft took part in a search for the missing aircraft, and at 1400 hours a report came in that wreckage had been spotted on a mountainside by Lake Kleifarvatn, about fifteen miles south of Reykjavik (see Map 3). Due to darkness and ice on the mountains, the ground search party was unable to reach the wreckage until the 21st. Wreckage from the Canso was strewn over the mountain just 100 feet below its summit, and none of the crew had survived the crash. They were buried at Fossvogur Cemetery, just to the east of Camp Maple Leaf, on 24 December. An RAF Court of Inquiry made a finding of pilot error, and operational fatigue was probably a contributing factor. Discussing this crash and Canso 9779's landing accident on 16 November, the squadron's ORB stated that

two flying accidents have occurred during the past six weeks, and unfortunately one proved fatal to all the crew. Both crews concerned were at the end of their tour of operations and it is felt that it is definitely necessary to T.X. [time expire] crews when they have a tour completed. This has been the practice and with transportation of new crews from Canada so slow, we are operating at a strength of twelve active crews for operations.¹¹⁶

¹¹⁵ The crew consisted of F/L E.P. Oakford, pilot, F/O G.P. McKenna, 2nd pilot, WO2 J.N.D.H. MacDonald, navigator, F/L T.J. Pettigrew, WAG, F/O F.W. Latham, WAG, P/O H. Steinberg, WAG, WO2 E.R. Attree, flight engineer, and Sgt. D.G. Bewley, flight engineer.

¹¹⁶ 162 (BR) ORB, 19 December 1944, summary for December 1944, December 1944, Appendix H, "Maintenance Monthly Report, December 1944 - No. 162 Sqdn. RCAF". Time expired crews were returned to Canada for other duties, such as instructors, or to retrain for other duties, such as WAGs retraining as pilots. For some information about aircrew replacements in the squadron, see 162 (BR) ORB, March 1944, Appendix B, "Service Training Report," 3-4.

This was neither the first nor the last crash in this area. Prior to May 1943 at least two aircraft had been lost while taking this shortcut in bad weather, and on 27 March a Hudson of 251 Squadron crashed in roughly the same area. "Landing in Iceland," Coastal Command Review, 2:1 (May 1943), 21, DHist 181.003 (D963); 162 (BR) ORB, 12 April 1945. F/L Oakford and crew might have been taking this shortcut in order to return to base in time to see an ENSA show at Camp Maple Leaf. Conversation with C.V. MacLachlan, 27 December 1995, Ingersoll, Ontario; 162 (BR) ORB, 19 December 1944.

The transportation of personnel, freight, and mail to and from Canada was a sensitive issue with the squadron. Almost one year after 162 (BR)'s arrival in Iceland, service was still subject to unacceptable delays. On 1 December, the ORB noted that

difficulty is continually being experienced in the transportation of new and tour expired personnel to and from Canada. The squadron has now been waiting two months for the arrival of Chefs, laundry workers and dairymen, who are urgently needed. At present fourteen time expired Aircrew have been cleared and are awaiting transportation to Canada It seems evident that a regular flight between Canada and Iceland is the only solution to the problem of bringing in supplies, mail, and new personnel.¹¹⁷

Two days later there were eighteen time expired aircrew awaiting repatriation, and with the voice of experience the ORB predicted that "the chances of getting home before Christmas appear very slight . . ." ¹¹⁸ On 5 December, however, a Liberator arrived from Goose Bay carrying the long-awaited personnel and left on the 11th carrying some of the squadron's time expired personnel home to Canada. With the arrival of the squadron's own chefs, the Aircrew Cafeteria was opened on 8 December, and "the boys really enjoyed eating in their own Camp after eleven months of the RAF meals." Three days later the squadron laundry started up. The Christmas turkeys and mail were flown in by Liberator on 22 December, just in the nick of time, and more Christmas mail and some Christmas trees were brought in the same day by one of the squadron's Cansos.¹¹⁹

The opening of the squadron's own aircrew cafeteria was one of the changes that Camp Maple Leaf had undergone since July of 1944. During the "flap" that followed the attacks on *U-300* in August, the RAF aircrew cafeteria had been unable to feed all of the aircrew going on patrol, and discussions later in the month led to the decision that 162 (BR) should operate its own aircrew mess. But as seen above, transporting the necessary personnel to Iceland proved to be the biggest obstacle.¹²⁰ The laundry personnel that came

¹¹⁷ 162 (BR) ORB, 1 December 1944. For signals and correspondence dealing with transportation problems during the squadron's stay in Iceland, see DHist 181.003 (D4864).

¹¹⁸ 162 (BR) ORB, 3 December 1944.

¹¹⁹ *ibid.*, 5, 11, 8 December 1944.

¹²⁰ *ibid.*, 7, 26 August 1944, 1, 8 August 1944.

through on the same aircraft as the chefs were meant to provide another essential service previously provided by the RAF. The laundry equipment had arrived on the RCAF ship *Eskimo* on 15 October, but was not installed until mid-November, when the squadron's Protestant chaplain, S/L Davidson, organized a work party to install the equipment, since the RAF's Works section had not yet done so. The installation of an RCAF laundry was welcome, considering that the RAF had not provided full or frequent laundry service. Other services for the personnel, such as a tailor, a cobbler, and a barber were also set up and running by November.¹²¹

While transportation to and from Iceland and returning aircraft to Canada for servicing were the direct cause of difficulties for the squadron such as delays in mail service and the time taken to bring replacement aircraft back from Scoudouc, other problems were caused by the situation. During the last part of 1944 entries in 162's ORB, especially the monthly maintenance reports, constantly refer to the shortage of spare parts for the aircraft and the negative effect of these shortages on the squadron's operational capabilities.¹²² Sending aircraft to Scoudouc might seem straightforward, even if delays were encountered, but aircraft sent to Scoudouc for servicing did not necessarily return to 162 (BR). Ordinarily, this would not have been a problem, but in December of 1944 162's Cansos had some unique armament modifications in the form of the "eyeball" nose turret. The replacement Cansos being sent from Scoudouc, however, were equipped with the outdated turret, and no spare "eyeball" turrets were available, so the maintenance section in

¹²¹ *ibid.*, 15 October 1944, 11, 13, November 1944, Summary for November 1944. The Laundry Officer from Goose Bay flew in to provide assistance with the installation. Prior to the establishment of the squadron's laundry, all of its officers and about 75% of the airmen had been responsible for their own laundry, with the other 25% sending major items to the RAF laundry in Reykjavik. The RAF had also been responsible for washing bedding. Sheets and pillow slips were washed once every two weeks, and blankets once a year. The RAF's infrequent washing of bedding was a problem experienced by other RCAF squadrons on RAF bases. "No. 162 Squadron (RCAF) - Miscellaneous Costs of Squadron at Iceland," Appendix C, "Establishment and Capitation Rates," 4, DHist 181.009 (D3410); Greenhous *et. al.*, The Crucible of War, 399.

¹²² 162 (BR) ORB, August-December 1944, *passim*.

Reykjavik had to remove the turrets from outgoing aircraft and then install them in incoming Cansos.¹²³

Finally, more problems that had plagued 162 since its arrival in Iceland had not yet disappeared. Maintenance equipment, such as the Herman Nelson heaters used to provide heat to crews working outdoors and to remove ice and snow from aircraft, were in short supply, and some of these badly needed heaters awaited transport from Goose Bay to Reykjavik. On some occasions, aircraft scheduled to carry out patrols had had their takeoffs delayed by a lack of heaters for de-icing the aircraft.¹²⁴ In addition to acquiring more equipment, efforts were still underway to improve the rather spartan maintenance facilities, especially the squadron's only full hangar, which was poorly heated and lit. In September, the squadron finally gained full use of this building, when the Liberator which had been in the back of the hangar since sometime in 1943 was finally removed. A transformer was installed in October to allow the use of 110 volt appliances and extension lights in the hangar, which had been wired for 220 volt service, and upgrading the outdoor dispersal points was finally begun, with electrical outlets to provide light and heat, a necessity in the lengthening nights, especially since the squadron had run out of flashlight batteries by September 1944.¹²⁵ Motor transport was also another problem that continued to plague the squadron. At the beginning of November, the ORB noted that "the M.T. [Motor Transport] Section is unable to cope with the demands for transportation owing to unserviceability of vehicles and unable to obtain necessary parts. Crews have been kept waiting for hours for transportation both before and after flights."¹²⁶ Efforts were begun to create an MT section in the squadron, but had not been resolved by the end of 1944,

¹²³ *ibid.*, December 1944, Appendix H, "Monthly Maintenance Report, December 1944 - No. 162 Sqdn. RCAF," 1.

¹²⁴ *ibid.*

¹²⁵ *ibid.*, Maintenance reports for September through December 1944.

¹²⁶ *ibid.*, 1 November 1944.

especially since investigation revealed that the RAF did not have enough equipment for their own needs, let alone for the RCAF as well.¹²⁷

Besides transport and supply, another ongoing concern was the morale of squadron personnel, especially the groundcrew, whose length of posting in Iceland remained indeterminate and who did not enjoy leave like the aircrew did. The ORB summarized in August: “the general health of the squadron has been good but morale has dropped owing to the boys getting browned-off in not knowing anything definite about leave or length of tour in Iceland. If something definite could be established, a great boost to moral would be the result.”¹²⁸ Disciplinary problems were probably caused by the morale problems; the theft of liquor from the central warehouse on the night of 31 August/1 September implicated eight squadron members. Although one was acquitted, others received sentences ranging from a severe reprimand to 171 days’ detention. The issue of length of tour in Iceland was resolved by A/V/M G.O. Johnson, AOCinC of Eastern Air Command, who visited Reykjavik in early October and who during his visit informed the squadron that they would be on the island “for the duration.” The ORB commented that “this news although not the best for morale will make the boys more contented and let them know that they will be here for Xmas.”¹²⁹ The issues of length of tour in Iceland, leave, and repatriation were to recur in the new year and were largely resolved before the end of the war. The transportation problems and shortage of equipment and spares, however, were not so easily resolved.

Despite these nagging issues the squadron performed its operational tasks well. Between July and December 1944, 162 (BR) had flown 627 sorties totalling almost 6600 hours of operational flying and over 1000 hours of training and test flying. During this time one successful attack had been carried out, damaging *U-300* on 4 August. In

¹²⁷ *ibid.*, 20, 22 November 1944.

¹²⁸ *ibid.*, Summary for September and August 1944.

¹²⁹ *ibid.*, 1 September 1944, 13, 8 October 1944.

comparison with the successes of June the squadron's effectiveness during the latter half of 1944 may seem limited, but the decreasing effectiveness of aircraft against submarines was a widespread phenomenon. The attack on *U-300*, for instance, was the only successful attack made on a U-boat by aircraft in the Northern Transit Area in August 1944.

Following the recall of the detachment at Wick in early August and the establishment of inshore patrols later the same month, much of the squadron's effort was devoted to inshore and convoy patrols. From the onset of local patrols on 26 August to the end of December, over 2000 hours of patrols were flown in the Reykjavik area by 162 (BR), the Liberators of 53 Squadron, and the station flight of Ansons (see Appendix F). About three quarters of the time was devoted to patrols while the remainder was spent on convoy escort. The western part of the Northern Transit Area, which was the responsibility of aircraft from Iceland and 15 Group received a lesser amount of attention following the onset of the inshore U-boat campaign. The great width of the area's western end also led to a decision to concentrate flying in the narrow area between the Shetland Islands and Norway. As the inshore campaign progressed, Iceland and 15 Group devoted fewer and fewer flying hours to patrols in the western half of the Northern Transit Area.¹³⁰

In addition to the complications of the inshore campaign, bogus schnorkel sightings had also begun in September 1944, and just under half of Coastal Command's sightings and attacks made between then and December had been made on willywaws, whales, and other non-submarine targets. Due to the adoption of the schnorkel and the almost continual submergence of U-boats, the effectiveness of Coastal Command's aircraft generally had declined: during the last three months of 1944 only one U-boat (*U-772*) was sunk

¹³⁰ *ibid.*, Summaries for July-December 1944; Air Ministry, "The RAF in Maritime War," V, 62, 62, n.3, 87, n.2, 93, n.2, 106, n.1., 77, 89, 107. The October flying hours recorded in the latter document are unfortunately incomplete, and do not allow accurate totals to be reached. A breakdown of 162's flying hours is provided for some months in its ORB, but unfortunately does not seem to differentiate between convoy escort and patrol flying. While other Groups in Coastal Command increased the amount of time devoted to convoy escort, the figures for flying in the Reykjavik area are inconclusive (see Appendix F).

exclusively by the Command's forces. The decreasing effectiveness of the aircraft against the U-boat was demonstrated by successful U-boat attacks made on convoys provided with escort. The attack made off Reykjavik by *U-979* on 21 September that damaged the S.S. *Yukon* was made in spite of close escort from a 53 Squadron Liberator which sighted neither torpedo nor U-boat prior to the attack and failed to locate the submarine afterwards. The failure of the surface escorts to find *U-979* after the attack was a demonstration that even surface craft experienced great difficulty in locating and attacking U-boats in inshore waters, difficulties they encountered again when *U-300* operated off Reykjavik in November. Unfortunately for Allied anti-submarine forces, no solutions to this problem had appeared, and none seemed likely in the new year.¹³¹

¹³¹ *ibid.*, 87-88, app. VI, 1; Greenhous et. al., The Crucible of War, 415.

Chapter 8

Until the End: January-August 1945

Thus there were few opportunities for aircraft to detect, let alone attack, U-boats from the time they left harbour till they regained it two months later. If, in the counting of heads killed, Coastal Command may seemingly have a poor record during this inshore phase it must always be remembered that the dread of their presence imposed such caution that U-boats were robbed of most of their power of attack.

D.V. Peyton-Ward, "The RAF in Maritime War," V, 193.

As 1944 came to an end, the war against the U-boat entered a new phase.

Operating in shallow waters close to shore and relying on the schnorkel and constant submergence to avoid detection, the German submarine arm was able to maintain an offensive against Allied shipping. Aircraft, formerly a dangerous enemy of U-boats, were robbed of most of their effectiveness by this move. Surface ships, too, encountered many difficulties in locating U-boats lying on the bottom in shallow water or operating in inshore areas where water conditions made Asdic detection almost impossible.¹

For 162 (BR), based in Iceland, this shift in operational patterns was a great change from June 1944, when U-boats had been encountered on the surface and its aircraft had destroyed four and shared in the sinking of a fifth. Sinkings in Faxse Bay, Iceland, demonstrated that German submarines could now operate with impunity only miles from the airfield in Reykjavik, making successful attacks and escaping despite air and surface escort. The attacks by *U-300* on 10 November 1944 that sank three ships also showed that U-boats were able to operate inshore in weather that scattered convoys and interfered with flying. But the waters off Reykjavik were not the only area where the inshore campaign was being fought. In the waters around the British Isles, U-boats continued to operate

¹ See Marc Milner, "The Dawn of Modern Anti-Submarine Warfare: Allied responses to the U-Boats, 1944-45," *RUSI Journal*, 134:1 (Spring 1989), 64-66; Marc Milner, *The U-Boat Hunters: The Royal Canadian Navy and the Offensive against Germany's Submarines*, (Toronto: University of Toronto Press, 1994), 154-156, 204-209 for a discussion of these surface ship problems.

despite air and surface patrols, and occasionally scored notable successes.² And so 162 (BR) fought the last months of the war engaged in important but largely fruitless patrols.

By December 1944 the inshore U-boat campaign had made Coastal Command's original intention to concentrate on operations in the Northern Transit Area essentially unworkable. By then the Admiralty and Coastal Command had agreed upon a policy for the use of aircraft against the U-boat. Close air escort was provided to important convoys passing through what were thought to be dangerous areas, inshore patrols were flown over areas thought to be U-boat billets, and patrols were maintained over areas through which U-boats had to pass, especially the Northern Transit Area. A compromise between providing close escort to all convoys and flying patrols around the coast without concern for convoy escort, the assignment of patrols was decided upon daily by the Admiralty's Submarine Tracking Room, Coastal Command Headquarters, and CinC Western Approaches in Liverpool. This decision making process faced a major problem by the end of 1944, however. The Submarine Tracking Room had depended on Enigma intercepts and HFDF (High Frequency Direction Finding) bearings for much of its work, but a new German policy of limited transmissions greatly reduced the number of bearings that were taken and thus diminished the usefulness of HFDF bearings. U-boats were also operating singly, instead of in groups, which further reduced radio traffic. Enigma intercepts, which were an extremely valuable source of intelligence and which had provided some warning of the beginnings of the inshore campaign, were almost completely eliminated by another change in German signals; the use of *Sonderschlüssel*, which provided each U-boat with an individual Enigma key instead of a general key used by all U-boats. Without enough material for analysis, British cryptanalysts could not break the new settings used on the Enigma machines, and a major source of operational intelligence dried up. As the official

² One of the first inshore patrols carried out was by *U-482*, which sank four merchant ships and a corvette in the Irish Sea during August and September 1944. *ibid.*, 175-176; Great Britain, Air Ministry, Air Historical Branch, "The RAF in Maritime War, V: The Atlantic and Home Waters - The Victorious Phase, June 1944 to May 1945," 62-63, DHist 79/599.

history of British Intelligence states, “in the battle with the U-boats in the inshore waters, the Enigma was at last failing to provide reliable intelligence on the operations of the U-boats and the intentions of the U-boat Command.”³

With increased U-boat activity and the entry of the new U-boat types into service forecast for the new year,⁴ the USN agreed in early January to provide three Liberator squadrons, a flight from No. 63 MAD⁵ Catalina squadron, and a squadron of Venturas to operate around the British Isles. They did not become operational until February and one of the Liberator squadrons was retained in Morocco following two U-boat attacks in early January. Before the new American squadrons arrived, Coastal Command anti-submarine aircraft strength in the British Isles and Iceland stood at twenty-nine and a half squadrons totalling 420 aircraft. Of these, eight squadrons with a strength of 107 aircraft were in 18 Group, operating inshore off the Scottish coast and in the Northern Transit area, while two

³ The literal translation of *Sonderschlüssel* is “special key”. *ibid.*, 193-194; Günter Hessler, The U-boat War in the Atlantic, 1939-1945, Volume III: June 1943-May 1945, (London: HMSO, 1989), 93; V.E. Tarrant, The Last Year of the Kriegsmarine, May 1944-May 1945, (London: Arms and Armour Press, 1994), 163; F.H. Hinsley, British Intelligence in the Second World War: Its Influence on Strategy and Operations: Volume Three, Part II, (London: HMSO, 1988), 471-474, 482. It should be pointed out that less specific and detailed operational intelligence was gained from the messages passed between Captain U-boats Norway and U-boat Command, which continued to use the general U-boat key. The scale of the inshore operations and some information about intentions was gained from this source. *ibid.*, 472. For the eventual effect of the First Sea Lord’s memorandum on Allied planning, see Air Ministry, “The RAF in Maritime War,” V, 201-203.

⁴ A memorandum from the First Sea Lord on 6 January predicted a major U-boat offensive beginning in February or March and doubted that the Admiralty and Coastal Command could contain the threat before severe losses to shipping would occur. These losses could threaten Allied forces in western Europe and affect the buildup of forces in the Far East. The entry of the Type XXI and XXIII U-boat into service was predicted for February or early March. Considering this gloomy forecast, it was small wonder that American squadrons were requested. S.W. Roskill, The War at Sea, 1939-1945: Volume III: The Offensive, Part II: 1st June 1944-14th August 1945, (London: HMSO, 1961), 289-291; Air Ministry, “The RAF in Maritime War,” V, 197-198.

⁵ MAD was an acronym for Magnetic Anomaly Detector (often called Magnetic Airborne Detector during the war), which allowed aircraft to detect disturbances in the earth’s magnetic field caused by large masses of metal at very short ranges. In principle, aircraft equipped with MAD could detect submerged U-boats, but the short range of the equipment made this a very difficult proposition. Number 63 Squadron Catalinas equipped with MAD gear scored some successes against U-boats attempting to pass through the straits of Gibraltar, and while attached to 19 Group sank *U-1055* on 30 April 1945. Norman L.R. Franks, Search Find and Kill: Coastal Command’s U-boat Successes, (Bourne End: Aston Publications, 1990), 124.

squadrons totalling thirty-one aircraft were based in Iceland, operating inshore off Reykjavik and in the transit area to the south of Iceland. As an aside, it is worth noting that only two of the almost thirty squadrons were not equipped with centimetric radar; 162 (BR) was one of them, but, as described below, this was soon to change.⁶

Along with 53 Squadron RAF, which was equipped with Liberators, 162 (BR) made up the entire anti-submarine force based in Iceland. 53 Squadron's Liberators were equipped with Leigh Lights, which made them far more useful for nighttime patrols than 162's Cansos, although a trial flare installation for the amphibians was in the works.⁷ In January, 89 hours were flown on inshore patrols off Reykjavik, mostly on convoy escort, but no U-boats were operating in the area. Midway through the month, three of 162's Cansos were sent to Wick due to concerns about U-boat activity off the north coast of Scotland. This was probably connected to the four U-boats sent to patrol off Scapa Flow in the Orkney Islands in order to attack the Royal Navy carrier forces based there. Between 24 November and 25 December six boats were dispatched to patrol areas off the islands, but no sightings or attacks were made on the carrier forces. One boat was sunk by frigates and another through unknown circumstances, but their presence off the Orkneys was not disclosed by Ultra until 16 December, nine days after the first boat had reached its patrol

⁶ Hinsley, British Intelligence in the Second World War, III, pt. 2, 481-484; Air Ministry, "The RAF in Maritime War," V, 195-196.

⁷ *ibid.*, app. 1, "Order of Battle - Strength and Availability," 1 November 1944, 1 January 1945; 162 (BR) ORB, January 1945, Appendix C, "Maintenance Report for January 1945"; *ibid.*, February 1945, Appendix D, "Maintenance Report for Month of February 1945". Trials of the 1.7" flare chute on Canso "A" 11097 were carried out on 28 February. Eastern Air Command had planned to install such flare chutes in its BR aircraft, but delays in delivery meant that the necessary equipment was not available until the latter part of January 1945. While the relevant document does not mention flares for 162 (BR), it can probably be assumed that the decision to fit this equipment was made by EAC. Memorandum, Chief Staff Officer to AOCinC EAC, "ASW - Tactical Devices - Policy. Radar - Cansos," 21 January 1945, DHist 181.002 (D233). The Leigh Light meant that 53 Squadron's Liberators were used for nighttime inshore patrols. Earlier in the Battle of the Atlantic, it would have been extremely unusual to use such long-ranged aircraft so close to base, but the abandonment of the mid-Atlantic by U-boats in late 1943 and the beginning of the inshore campaign in September 1944 meant that inshore patrols were now the norm for many anti-submarine aircraft. It is unclear whether the station's flight of Ansons, which are mentioned as carrying out patrols in August, were still doing so.

area. These decrypts probably triggered the increased air patrols in the area which 162 (BR)'s Cansos joined in mid-January, although other reasons for their dispatch to Scotland cannot be ruled out.⁸

The poor performance of *U-979* on its December patrol in Faxse Bay may have influenced BdU's decisions about inshore operations near Reykjavik, for the next U-boat to operate in this area, *U-1022*, did not leave base until 12 February. BdU's priorities had definitely been in areas other than the waters off Reykjavik; the U-boats dispatched during December had been sent to patrol off the Orkneys, as noted above, the English Channel, and in the Irish Sea. The southern part of the latter had become an important U-boat operational area since convoys had begun using the Southwestern Approaches rather than the old route via the North Channel in late September 1944, and U-boats on patrol in the area had met with success, which led to more boats being dispatched there. January patrols were again carried out primarily in the English Channel and Irish Sea, with some patrols off the Scottish coast as well. The efforts to reorganize the Norwegian bases to increase the operational capability of the U-boat arm were beginning to pay off by then, since thirteen new boats made the trip from Kiel to Norway during the month and twenty sailed on operations as opposed to eleven during October 1944. One of the twenty was *U-2324*, the first of the prefabricated Type XXIII U-boats to enter service. Another Type XXIII entered service in February, when forty-one U-boats sailed on operations and twenty-four came up from Kiel to Norway. The increased sailings probably motivated BdU to expand its efforts to areas such as Reykjavik, where *U-1022* arrived on station on 27 February. The next night the boat encountered convoy UR 155 off Skagi light, sinking the Panamanian *Alcedo* (1,349 tons) in a night attack, then firing another torpedo spread

⁸ The carrier forces had been attacking shipping off the Norwegian coast, and on 3 December BdU decided to act against them. The U-boats were to intercept the carriers as they left or returned to their base at Scapa Flow. Air Ministry, "The RAF in Maritime War," V, 104-105, 208; 162 (BR) ORB, 13-14 January 1944; Tarrant, Last Year of the Kriegsmarine, 165-168; Hinsley, British Intelligence in the Second World War, III, pt. 2, 473.

without result and making off without being detected. A Leigh Light Liberator of 53 Squadron was providing air cover, but was carrying out a Cobra patrol several miles from the convoy at the time of the sinking. In a remarkable failure, the convoy did not notify the aircraft of the sinking, and its crew were unaware of the attack until they returned to base.⁹

The next day, 1 March, another of 53 Squadron's Liberators may have detected *U-1022*. Shortly before midnight, M/53 obtained a firm radar contact some twenty-five miles to the northwest of Skagi and homed in to a range of one mile before switching on its Leigh Light. Nothing was sighted, but sonobuoys were dropped and two attacks were made with Mark 24 Mines without result. Early on 3 March, *U-1022* struck again, sinking the anti-submarine whaler *Southern Flower* (328 tons) just four miles off Skagi. Although all available Cansos were dispatched to help in the search, the submarine avoided detection by the local force of whalers and trawlers and on 10 March attempted to attack a group of these vessels about fifteen miles northwest of Skagi, but broke surface in the heavy swell as she was moving into firing position. She was sighted and attacked with gunfire and depth charges, but managed to escape with minor damage and left for home on 13 March. Six days earlier, *U-773* had arrived off Reykjavik, but spent an uneventful and unproductive patrol, neither sinking any ships nor being attacked.¹⁰

Local patrols and convoy escort were not the only responsibility of 162 (BR) and 53 Squadron. Despite the importance attached to inshore patrols, attempts to interdict U-boat traffic through the Northern Transit Area continued. While only eighty-nine hours were spent on patrols in the Reykjavik area in January 1945, 875 were devoted to

⁹ The lesser efficiency of Norwegian bases probably also influenced the dispatch of U-boats to Iceland. With a limited number available for operations, it would have made more sense to patrol the areas that had proved more profitable in the past. Air Ministry, "The RAF in Maritime War," V, 106, 94, 204, 209, 192, 213; Tarrant, *Last Year of the Kriegsmarine*, 167, 192-199; Roskill, *The War at Sea*, III, pt. 2, 181-182; Hessler, *The U-Boat War in the Atlantic*, III, 89-90; Jürgen Rohwer, *Axis Submarine Successes, 1939-1945*, (Annapolis: United States Naval Institute, 1983), 191. A "Cobra" patrol was carried out around the convoy at a distance specified by its Escort Commander.

¹⁰ Air Ministry, "The RAF in Maritime War," V, 225; Tarrant, *Last Year of the Kriegsmarine*, 197-198; 162 (BR) ORB, 3 March 1945.

patrolling the western part of the transit area. It appears that 162 bore much of the responsibility for this flying with a total of just over 800 operational flying hours, since 53 Squadron was re-equipping with a new mark of Liberator. During this month, sixteen U-boats passed outward through the area and nine inward, but no genuine sightings were made anywhere in the transit area. In February, a total of 103 hours of patrols were flown in the Reykjavik area, while aircraft from Iceland and 18 Group provided 861 flying hours in the western half of the Northern Transit Area. Leigh Light Liberator V/53 made a radar contact in the area on the night of 5/6 February that might have been the homeward bound *U-1232*, although no attack was made. March witnessed a ninefold increase in flying time in the Reykjavik area: from 103 to 959 hours, but aircraft from Iceland and 18 Group managed only a few more hours in the western part of the Northern Transit Area than in the previous month. The only sighting in either area was Liberator M/53's possible radar contact and subsequent attack on *U-1022* off Reykjavik, although operations by 18 Group to the north of Scotland damaged one U-boat and sank one or possibly two more.¹¹

While the anti-submarine patrols may not have brought the same results they once had, the hazards of flying over the ocean for long periods of time remained the same. On 5 March the weather closed in so rapidly that the four Cansos on patrol were diverted to Stornoway. Of the aircraft on local flights, two landed safely, while the other had to make a water landing at Hafnarfjordur and taxi for over an hour to get back to base. Four days later, two Liberators from 53 Squadron on convoy escort collided in mid-air. The tail fin on one aircraft struck one of the inboard engines on the other, damaging both aircraft. Bad weather in Iceland, however, meant that they were diverted to the British Isles. The entry in 162's ORB accurately described this incident as "a very close call." Hazards also existed on the ground. During January Canso "A" 11065 hit a sunken gun emplacement while

¹¹ Air Ministry, "The RAF in Maritime War," V, app. XVIII; *ibid.*, app. I, "Order of Battle, Strength and Availability," 1 January 1945; *ibid.*, 209, 214. All patrol times given are total hours. Effective hours (time actually spent on patrol or escort) are somewhat less. See Appendices H and I for details.

taxiing and its undercarriage and hull was damaged. At first, it was thought that repairs could be made with the assistance of the RAF's Repair and Salvage section, but in fact the nose had been bent out of alignment and extensive repairs, which might not be effective, were required. As a result, 11065 was reduced to spares for other aircraft and its hull written off.¹²

Flying hazards were a constant during 162 (BR)'s stay in Reykjavik, and during the first months of 1945 it seemed that transportation problems between Canada and Iceland were yet another constant. From early January onwards, entries in the ORB refer to the lack of incoming mail with increasing frequency. "Many requests . . . asking for monthly returns and replies to correspondence," the entry for 11 January read, yet there had been "no incoming mail to Iceland since 22 Dec/44 and no outgoing mail since 29 Dec/44. Signal sent to E.A.C. notifying them of the mail situation. Needless to say that the absence of personal mail is causing serious discontent amongst the personnel of this squadron."¹³ The next day an entry noted that "this is the longest period of time the Squadron has been without mail since moving to Iceland."¹⁴ Problems with transport affected other aspects of the squadron. By 26 January, the ORB noted that three crews had been awaiting transport from Goose Bay to Reykjavik for over two months, and that a Canso had been grounded for six weeks awaiting a shipment of parts from Goose Bay. Daily, aircraft were arriving from Canada on their way to the British Isles, but still no mail, aircrew, or parts were forthcoming from Eastern Air Command. The transport problems were in both directions, however; the ORB also noted that the movement of groundcrew from Reykjavik to Canada, planned to begin at the end of January, would be a difficult undertaking if present transportation problems continued. The morale problems caused by the lack of mail definitely contributed to a fight in the NCO's club on 30 January which led

¹² 162 (BR) ORB, 5, 9 March 1945, Summary for March 1945, Maintenance Report for January 1945, Maintenance Report for Month of February 1945.

¹³ *ibid.*, 11 January 1945.

¹⁴ *ibid.*, 12 January 1945.

to two arrests and a court-martial. In addition to morale problems caused by the interruption of personal mail, the functioning of the squadron itself was impaired by the lack of official correspondence. There was also a shortage of badly-needed parts that remained in Goose Bay. One Canso actually had to be grounded and used as a source of parts to keep other aircraft operational.¹⁵

The mail problem was resolved on 6 February when three Liberators arrived. The first, a transport aircraft from 11 (BR), carried 18 personnel but no mail, to the disappointment of the squadron. A few hours later two more transports from 168 (HT) Squadron arrived, carrying nearly two tons of mail, the first received by the squadron since 22 December. One of the Liberators left that evening with time expired aircrew for repatriation, while the other two aircraft left the following day, carrying more aircrew to Canada. More mail from Canada arrived by way of the United Kingdom on the 7th. More trips by 11 (BR)'s transport Liberator were made from 11 February onwards, but on the 13th the backlog at Goose Bay still stood at ninety passengers and over a ton of freight, as a consequence of the poor service to Iceland. This problem had received attention from Eastern Air Command and Air Force Headquarters in Ottawa, and action was being taken to improve the service to Iceland. Among the personnel arriving on the first Liberator was F/L Milliken, the Senior Traffic Officer from 164 (Transport) Squadron, who had been sent to Iceland to help remedy the transportation problems between there and Canada by training an officer and some personnel from 162 (BR) in loading and unloading aircraft, since similar arrangements had encountered difficulties before.¹⁶

¹⁵ *ibid.*, 26, 17, 5, 30-31 January 1945, Summary for January 1945, Appendix C, "Maintenance Report for January 1945," 1. By the time the mail actually arrived, several safety equipment workers had lost a promotion because a new establishment for them had been approved at the beginning of January, but news of this change was not received until mid-February, by which time the promotions had been stopped due to the posting of the personnel. The best remedy that could be offered was a promise of the opportunity for promotion at their next unit. *ibid.*, February 1945, Appendix D, "Maintenance Report for the Month of February, 1945."

¹⁶ *ibid.*, 6-7 February 1945; EAC HQ to 9 Transport Group, signal A.811, 14 February 1945; CAS to AOCinC EAC, "RCAF Air Transport - Passengers, Cargo and Mail - Weekly Service

With the re-establishment of air transport to and from Canada, the groundcrew, who had been in Iceland for over a year, were finally heading home. Originally planned to begin at the end of January, repatriation was delayed until early February. On the 6th, the first group of eighteen groundcrew arrived from Canada as replacements for the tour expired (TX) personnel in Iceland. At a muster parade two days later, the squadron's OC, W/C Sully, "thanked the boys for their splendid work during the past year and outlined the repatriation movement."¹⁷ The first group of TX groundcrew did not leave Reykjavik until 16 February, when eighteen of them left on board Liberator 3704 from 11 (BR). By the end of February, about sixty groundcrew had been repatriated while one hundred and eighty more awaited transport. The ORB soon noted that the new arrivals were settling in and appeared to be enjoying their new home in Iceland. Arrivals and departures continued throughout March, and by the end of the month the changeover was almost completed. One of the added benefits of the frequent flights to and from Iceland was that the squadron actually received mail twice in one week. After the six week hiatus that had just passed, this must have been surprising.¹⁸

By the end of April the movement of groundcrew to and from Canada had been completed. Although the groundcrew must have been happy to return to Canada, a decision by AFHQ that returning personnel would be granted disembarkation leave but would forfeit leave accumulated during their stay in Iceland cast something of a shadow over their return. To aggravate the situation, the AOCinC of Eastern Air Command, A/V/M G.O. Johnson, and the A/V/M in charge of personnel had both visited Iceland and promised squadron personnel that all accumulated leave would be granted to returning personnel. Since groundcrew had no opportunity to take leave while in Iceland, this was,

Rockliffe - Goose - Iceland," 9 January 1945, DHist 181.003 (D4864). For the pilot's account of the transport flights by 11 (BR)'s 3704 (nicknamed the 'Basterpiece'), see C.R. Vincent, Canada's Wings, vol. 2: Consolidated Liberator & Boeing Fortress, (Stittsville, Ont: Canada's Wings, 1975), 74-76.

¹⁷ 162 (BR) ORB, 5 January, 6,8 February 1945, Summary for March 1945,.

¹⁸ *ibid.*, 16, 28 February 1945.

to say the least, an inconsiderate decision. Fortunately, AFHQ revised its decision and allowed returning groundcrew to take embarkation leave and accumulated 1944-1945 leave, but 1943-1944 leave was still forfeited. This decision demonstrated a lack of understanding of the groundcrews' situation on the part of AFHQ and might well have seriously affected the morale of personnel arriving in Iceland as well as that of the repatriated groundcrew.¹⁹

The groundcrew were not the only new personnel in the squadron. In late 1944 aircrew repatriation had begun, and by the end of November nearly all the aircrew who had been posted to Iceland along with the squadron in January 1944 had been replaced. The arrival of so many new groundcrew unaccustomed to the problems involved in operating from Iceland added to the squadron's difficulties. While at first the departure and arrival of groundcrew did not interfere with flying operations and maintenance, by the time a complete switchover had been made some problems did occur. On 28 April the ORB noted that "numerous cases of minor unserviceability caused considerable confusion and delay in getting operational aircraft off on patrols this a.m. All patrols were late on take-off from one to four hours - two of the aircraft returning to base with minor unserviceabilities due to aircrew 'finger' trouble."²⁰ At the beginning of May the weekly intelligence report noted that

this week has been particularly unfortunate in that a great deal of serviceability trouble was encountered. This may be accounted for by the fact that the groundcrew personnel are all new and many of the aircrew are new in this theatre of war. It may take some time to train both branches to meet the special operational problems in this area before the Squadron will be able to function as smoothly as formerly.²¹

¹⁹ "Weekly Intelligence Report No.2 - No. 162 Squadron - R.C.A.F. for week ending 23:59 Hrs. Thursday, April 5th/45," 2, DHist 181.003 (D58).

²⁰ 162 (BR) ORB, Summary for November 1944, Summary for March 1945, 28 April 1945. Finger trouble is "the state of having one's finger up one's arse. One who suffers from finger trouble might be stupid or wilfully awkward, ornery, or merely absent-minded." Charmion Chaplin, "Slang, Abbreviations, and Service Terms, RCAF at Home and Overseas, RAF and Fleet Air Arm, 1939-1945," 42, DHist 87/167.

²¹ "Weekly Intelligence Report No.6 - No. 162 Squadron, R.C.A.F. for week ending 23:59 Hrs. Thursday, May 3rd, 1945".

The difficulties experienced by the new personnel were not the only reason for maintenance and serviceability problems in the squadron, however. An adequate motor transport section was still required, and engine problems were caused by bad weather and inadequate spark plug maintenance equipment. Water in the fuel storage tanks was also a major problem, and on 26 April three aircraft on patrol were recalled to base for inspection when another Canso was unable to take off on patrol due to water in its fuel. Finally, a spate of APU (auxiliary power unit) failures in the squadron's Cansos only made the maintenance situation more troublesome, especially since spares were not at hand.²²

Although maintenance problems remained, transport to and from Canada remained a problem, and patrols were less productive, the squadron's radar situation, at least, was improving. While 162's Cansos had received improved armament and had been fitted to carry sonobuoys during 1944, their radar remained deficient. At the end of 1944, only two of Coastal Command's twenty-nine and a half anti-submarine squadrons in the British Isles and Iceland were not equipped with centimetric radar, and 162 (BR) was one of them. As discussed in earlier chapters, efforts had already been made to re-equip Eastern Air Command's Cansos with more modern equipment than the obsolete Mark II ASV, but problems with the intended replacements meant that the aircraft had to soldier on with equipment that was useless for anything other than navigation.²³ By November of 1944, however, discussions between EAC and AFHQ in Ottawa led to the decision to equip the command's Cansos with the American-built 3 cm ASD radar. The Joint RCN-RCAF Anti-Submarine Warfare Committee also discussed the issue of radar for Cansos, and minutes from its meetings record that by January of 1945 a prototype installation of ASD-1 radar had been tested in a Canso and was in the process of being installed in 162's aircraft. It

²² 162 (BR) ORB, Maintenance Reports for January through May 1945; "Weekly Intelligence Report No. 5 - No. 162 Squadron, R.C.A.F. for week ending 23:59 Hrs. Thursday, April 26th, 1945." Auxiliary power units were used to generate power while the aircraft was on the ground and its engines were not operating.

²³ Air Ministry, "The RAF in Maritime War," V, 196; Roger Sarty, "The RCAF's Eastern Air Command, ASV Radar, and Submarine Hunting," unpublished article, 13-17.

appears that with the possible exception of 116 (BR), 162 (BR) was the only Canso squadron to receive this improved version of the ASD radar, and that the other three squadrons were to receive the earlier ASD which had been taken from surplus Lockheed Venturas. Although the reason for fitting ASD-1 to 162 and not to other squadrons is not explained in the few available documents, the squadron's past encounters with U-boats and its location in an area where such encounters were seen to be more likely probably contributed to the decision to install the equipment.²⁴

The new equipment was considerably different from the old Mark II ASV. In place of the Yagi antennae that festooned wings and fuselage, the dish-shaped antenna was enclosed in a streamlined teardrop radome mounted on a pylon above and behind the cockpit. The internal equipment, including the cathode ray tube display was also quite different, since ASD had a "B-scan" display, as opposed to the "A-scan" used by Mark II ASV or the PPI (Plan Position Indicator) used by most of the earlier Marks of centimetric radar. While "A-scan" gave indications of range and direction, PPI plotted the position of the contact relative to the aircraft, displaying range and bearing on a screen that covered an

²⁴ 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), 602; Minutes of Joint RCN-RCAF Anti-Submarine Warfare Committee for 2, 16, 30 November 1944, 25 January 1945, 8 March 1945, NAC RG 24, vol. 11026, file COAC 7-19-2B, "Joint RCN/RCAF A/S Warfare Committee - Minutes of Meetings"; Memorandum from CSO to AOCinC EAC, "ASW - Tactical Devices - Policy. Radar - Cansos," 21 January 1945, DHist 181.002 (D233). ASD-1 was apparently considered for 116 (BR) because its Cansos were equipped with Leigh Lights, which required an effective radar in order to be useful. There were apparently plans to replace the searchlight with 1.7 inch flares, however, if they proved satisfactory in trials. Memorandum from CSO to AOCinC EAC, "ASW - Tactical Devices - Policy. Radar - Cansos," 21 January 1945, DHist 181.002 (D233). ASD proved difficult to maintain and suffered from poor quality control and lack of test equipment, although this problem was eventually rectified. ASD-1 was a redesigned version of the equipment that was easier to maintain. Memorandum, AMAE to AMAS, 6 July 1943, NAC RG 24, vol. 5345, file HQS.34-42-2, "ASD: Technical Aspects of"; Sarty, "The RCAF's Eastern Air Command, ASV Radar, and Submarine Hunting," 15-17; Douglas, The Creation of a National Air Force, 560. It appears that Canso 11093, after being equipped with ASD-1, underwent operational trials with 5 (BR) prior to serving with 162 (BR). AOCinC EAC to AFHQ, "ASD-1 Radar - Interference with Compass - Canso "A" 11093," 20 January 1945, NAC RG 24, vol. 5345, file HQS.34-42-2, "ASD: Technical Aspects of"; 162 (BR) ORB, Operations Record, 24 April 1945. Unfortunately, although a fair amount of documentation on Mark II ASV still exists, information on the use of later marks of ASV in the RCAF is much harder to come by. Further research in this area would be worthwhile.

entire circle around the aircraft. "B-scan" displays gave range and azimuth (bearing), covering an arc of 180° in front of the aircraft, extending 90° to port and starboard, although not in exactly the same manner as a PPI display. Areas to the rear of the aircraft were not covered, and the scope on ASD and presumably on ASD-1 as well, distorted the positions of the contacts.²⁵

One of the reasons for the obsolescence of Mark II ASV and its replacement with centimetric radar was that U-boats had been carrying a radar detector operating on the earlier radar's wavelength called *Metox* since mid to late 1942, and a more refined version called *Wanze* since August 1943. Following the introduction of the schnorkel, similar equipment (*Borkum*) with a receiving antenna mounted on top of the schnorkel head (*Bali I*) was introduced. This equipment was designed to cover wavelengths from 80 cm to 3.3 m, but could pick up centimetric emissions at ranges of up to three quarters of a mile. When surfaced, a search receiver called *Tunis*, which was effective against both ten and three centimetre radar, could be used, but it had to be brought up through the hatch upon surfacing and taken below when diving since it was not pressure tight.²⁶ The German

²⁵ "Interview by Roger Sarty with Ray Crone," 13 June 1993, 8, DHist Biographical File; Conversation with C.V. MacLachlan, 27 December 1995, Ingersoll, Ontario; "Brief Description of U.S. Airborne Radar Equipment," PRO AIR 15/111; Douglas, The Creation of a National Air Force, 560. For a fuller description of "B-scan" and the other displays, see Radar School, Massachusetts Institute of Technology, Principles of Radar, (New York: McGraw-Hill, 1946), 1-9 - 1-12. Mounting the antenna above and behind the cockpit apparently did not affect the radar's minimum range, which remained at about half a mile during US Navy tests of a similar mounting. A Coastal Command operational research report from early May 1945, however, suggests that ASD-1 (also known as Mk.VIIIa ASV) may have had a tendency to miss targets dead ahead, probably because the scanner was shielded by the nose of the aircraft. Memorandum, AMAE to AMAS, "3 Cm. A.S.V. Equipment Situation," 6 July 1943, NAC RG 24, vol. 5345, file HQS.34-42-2, "ASD: Technical Aspects of"; ORS/CC Report No. 344, "A Review of ASV Performance in Detecting Schnorkels," 4, 5 May 1945, DHist 81/765. A mock-up of a different ASD installation was tested by the RCAF in July 1943, and from the available information it appears to have featured a blister mounted in front of the cockpit which obscured the co-pilot's vision during landing. Memorandum, PD5 to D/DAD, "Canso Aircraft - Experimental Flexible Gun. Installation and A.S.D. Blister," 3 July 1943, NAC RG 24, vol. 5396, file HQS.60-3-12, vol. 5, "PBY Flying Boats".

²⁶ Air Ministry, "The RAF in Maritime War," III, 487, V, 88, 194-195; Milner, The U-Boat Hunters, 61-62. *Tunis*, introduced in May 1944, was a combination of the earlier *Fliege* and *Mücke* sets, which provided coverage of the 8 cm to 20 cm wavelengths and 2 cm to 4 cm wavelengths respectively. Tarrant, The Last Year of the Kriegsmarine, 34.

ability to detect 3 cm emissions therefore negated one of the reasons for installing ASD in Cansos, but another reason remained pressing: the detection of schnorkelling U-boats.

The schnorkel head presented a much smaller target than a surfaced U-boat, and radar such as the 1.5m Mk.II ASV fitted to EAC Cansos and the 50cm ASB intended to replace it were unable to detect such a small target.²⁷ Radar operating on a shorter wavelength, like the 3cm ASD and ASD-1 was able to detect small targets like schnorkel heads, although at much shorter ranges than surfaced U-boats could be picked up. Unless the sea was dead calm, however, even ASD could not detect a schnorkel, although this limitation was not immediately realized.²⁸ The problem of isolating the very small blip obtained from a schnorkel head from the extensive clutter caused by sea returns and then tracking it was recognized by early 1945, but by that time ASD and ASD-1 were already

²⁷ Sarty, "The RCAF's Eastern Air Command, ASV Radar, and Submarine Hunting," 16-17. Generally, radar cannot detect objects smaller than half its wavelength. Max Schoenfeld, Stalking the U-boat: USAAF Offensive Antisubmarine Operations in World War II, (Washington: Smithsonian Institution Press, 1995), 183. In November 1944 ASV Mark II was described as being "of no use in detecting schnorkel" and ASB was described as "highly unsatisfactory" for the same purpose. "Joint R.C.N. - R.C.A.F. Anti-Submarine Warfare Committee - Minutes of 34th meeting held at 1500 hours Thursday 2nd November, 1944," NAC RG 24, vol. 11026, file COAC 7-19-2B, "Joint RCN/RCAF A/S Warfare Committee - Minutes of Meetings". ASD commonly attained ranges of eighty nautical miles on single freighters and fifty miles on land masses. John S. Hall, ed., Radar Aids to Navigation, (New York: McGraw-Hill, 1947), 186.

²⁸ Even 3cm ASV could only detect schnorkel heads in seas less turbulent than those produced by Force 3 winds, and by September 1944 U-boats were able to schnorkel in sea states up to 5 or 6. Brereton Greenhous, Stephen J. Harris, William C. Johnston, and William G.P. Rawling, The Crucible of War: The Official History of the Royal Canadian Air Force Volume III, (Toronto: University of Toronto Press, 1994), 410; Air Ministry, "The RAF in Maritime War," V, 109. Determining the actual range at which ASD could detect a schnorkel is complicated by the widespread bogus sightings made during late 1944 and 1945, because the spray sucked up by the willywaws that caused many of the sightings was dense enough to register on later marks of centimetric ASV. Wartime operational research gave ASD a range of about six miles against schnorkels, and practice runs on dummy schnorkels tended to confirm this range. The range at which actual schnorkels, as opposed to bogus sightings (described then as sightings of schnorkels 'with vapour'), could be detected can also be obtained from wartime documents, and seems to have been about two miles. ORS/CC Report No. 344, "A Review of ASV Performance in Detecting Schnorkels," 5 May 1945, DHist 81/765; ORS/CC Report No. 343, "The Influence of the State of the Sea on the Efficiency of Visual Search for U-Boats, Periscopes & Schnorkel," 22 April 1945, DHist 81/765. See Milner, The U-Boat Hunters, 202-204 for a brief discussion of the effect of the schnorkel on radar in both the RCN and the RCAF and the actions taken to counter it.

being installed in EAC Cansos.²⁹ Despite objections that the new radar was an unwarranted expense at such a late date in the war, and some concerns that ASD might not prove effective against schnorkels, EAC had managed to win procurement of the new equipment. Coastal Command operational research reports concluding that centimetric radar was of limited use against schnorkels except in calm seas, which would have defeated the case for ASD, did not arrive until after the decision to install it in EAC Cansos was made. In any case, the entry of the new radar into service was delayed by problems in designing the necessary fittings for Cansos. For 162 (BR), installation was still underway in March, and training the crews in its use conflicted with sonobuoy training. The radar training programme apparently took priority over sonobuoy training, and due to a shortage of crews, some crews were flying patrols without having first had an air exercise in the use of sonobuoys.³⁰

²⁹ By the end of January 1945, the RCAF had been informed that "tests . . . indicate that centimeter type radars can pick up Schnorkel, but the resulting blip, because of its size, is most difficult to track through sea return and is hard to distinguish from noise. . . . both the U.S. Navy and the R.A.F. advise that there is no equipment presently in service which has proven itself to be capable of detecting Schnorkel and enabling attacks to be made upon the U-boat using it." CJS Washington to AFHQ, Ottawa, "Search Radar Versus Schnorkel," 27 January 1945, DHist 77/541. Shortly after the war, experts admitted that attempting to sort out such returns from clutter on airborne radar, involving what is called a Moving Target Indicator (MTI), "poses a difficult technical problem for which no practical solution has yet appeared." Hall, Radar Aids to Navigation, 256.

³⁰ Douglas, The Creation of a National Air Force, 602; "Joint R.C.N. - R.C.A.F. Anti-Submarine Warfare Committee - Minutes of 35th meeting held at 1500 hours Thursday, 16th November, 1944," NAC RG 24, vol. 11026, file COAC 7-19-2B, "Joint RCN/RCAF A/S Warfare Committee - Minutes of Meetings"; "Interview by Roger Sarty with Ray Crone," 8, 13 June 1993; SD Officer, 162 (BR) to CO, RCAF Station Dartmouth, 1 April 1945. The counter-argument to those who believed that the war would soon be over and that expenditure on new technical equipment was therefore not justified was that if modern equipment were not acquired at the earliest possible opportunity, the RCAF might find itself at the end of the war with obsolete equipment and no money available to replace it. CJS to AFHQ, "AN/APS15A Radar Equipment," 21 February 1945, DHist 77/541.

While some expressed concern that 3cm ASV would be useless against schnorkel, others assumed that it must be more effective than 10cm radar. In a discussion about the possible provision of AN/APS-15 radar for RCAF Liberators, the actions of the RAF and USN were also taken as proof of the general superiority of 3cm radar against schnorkels: ". . . although no conclusive operational reports indicating the superior performance of APS15 in the detection of Schnorkel U-Boats are available, there seems to be definite indications in tests carried out to date to bear in this direction. The APS15 has a basic advantage of operating at 3 cm. rather than 10 and in fact the RCN-RCAF Monthly Operational Review, Section IV (December) definitely states

Sonobuoys proved more useful than radar in a spate of sightings in April, however. After spending more than four months flying patrols and convoy escorts without a sighting, 162 (BR) made five during the month of April. Canso "A" 11097 and Canso "A" 11066 both made sightings on the first day of the month. The first aircraft sighted a "suspicious disturbance" in position 63° 32' N, 15° 38' W, but it disappeared before an aiming point for an attack could be determined.³¹ Canso 11066 had more luck with its sighting later in the day. The aircraft was flying an anti-U-boat patrol southeast of Iceland under 4/10 cloud in extremely good visibility when some small puffs of smoke were sighted eighteen miles away in position 63° 21' N, 14° 19' W. As the Canso approached, more puffs of whitish smoke were seen coming from the surface of the sea, but no contact was made on the 3 cm ASD-1 radar, and the crew formed the impression that an object was breaking the surface at frequent but irregular intervals.³² A sonobuoy was dropped and apparently returned screw noises at fifty-two revolutions per minute (rpm), so an attack was made with one Mark 24 Mine but no results were observed. Another sonobuoy was then dropped and it also picked up screw noises at fifty-two RPM. Twenty-three minutes after the first sighting, the puffs of smoke ceased. An assessment of "G" - "U-boat present, no damage." was made on 18 June 1945 by the U-Boat Assessment Committee.³³

that 3 cm. radar is considerably more efficient than 10 cm. against Schnorkel. After all, there must be some proof of this; otherwise, what would be the object of the R.A.F. and U.S. authorities changing to the latest type." CJS to AFHQ, "AN/APS15A Radar Equipment," 21 February 1945, DHist 77/541.

³¹ The crew consisted of F/O R.L. Clarke, P/O J.T. Roy, F/O M.H.R. Johnston, F/O T.R. King, P/O H.V. Miles, P/O G.T. Morrison, P/O R.M. Kennedy, P/O J. Pryshlak, and Sgt. R.A. Jenkins.

³² The crew consisted of F/O R.J. Mills, P/O T.G. LaPlante, F/O L.G. McKee, F/O M.H.R. Johnston, WO1 F.H. Banks, WO2 J.H.A. Rodrigue, WO1 H.N. Smyth, F/S D.K. Gate, and WO2 W.F. Phillips.

³³ "Weekly Intelligence Report No. 2 - No. 162 Squadron - R.C.A.F. For week ending 23:59 Hrs. Thursday, April 5th/45," 1, DHist 181.003 (D 58); Coastal Command Intelligence Summary, 1 April 1945 to 7 April 1945, 4, DHist 181.003 (D886); Air Ministry, "The RAF in Maritime War," V, app. VI, 24; Admiralty Assessment Committee, Serial No. M.33, 18 June 1945, PRO AIR 15/306. The squadron's weekly intelligence report attributes the second sighting and attack to U/162 (serial # unknown) instead of O/162 (serial # 11066), but no mention of the attack is found in the ORB, probably because of security restrictions applying to the Mark 24 Mine. The sighting by 11097 is not mentioned either, which suggests an accidental omission of both events.

In fact, no U-boat had been within 110 miles of the attack, and a postwar reassessment attributed the sighting to a school of whales or porpoises. False schnorkel sightings were not limited to willywaws or moribund waterspouts, and aircraft from other squadrons had made similar mistakes. Like willywaws, whales had been sighted and attacked before the introduction of the schnorkel. Although these cases of mistaken identity had been spotted and aircrew warned against them prior to the introduction of the schnorkel, after its introduction these warnings seem either to have been cast aside or forgotten in the rush to accept these sightings as genuine. The fact that sonobuoys could pick up the beating of the whales' tails and their accompanying cavitation, as they did in this case, lent credibility to the sightings, since U-boat propellers produced a similar effect. During April of 1945, over twenty whale sightings were reported as schnorkelling U-boats by Coastal Command aircraft.³⁴

Two days later, Canso "A" 11066, flown by F/O L.C. Martin and crew,³⁵ took off on an anti-U-boat patrol in the area to the north and northeast of the Faeroe Islands. Shortly after takeoff the aircraft made a radio check with base but was not heard from again and failed to return. The weather around Iceland had been good, and another squadron aircraft had passed through the patrol area after 11066, but spotted no sign of dinghies or wreckage. Aircraft in adjoining patrol areas also made no sightings. Two hours after the Canso was overdue, aircraft were dispatched to search its patrol area, and seventeen aircraft were devoted to the search on 4 April. Again, no sightings were made, and aircraft

³⁴ The postwar reassessment of this attack noted that 52 rpm was impossible on a U-boat, where dead slow was at least 100 rpm on both shafts or 150 on one, and this fact lends credence to the sighting being of whales or porpoises. Air Ministry, "The RAF in Maritime War," V, app. VI, 24, app. V, 2. Coastal Command Review published several articles on whales prior to the introduction of the schnorkel. See "Whales, not Submarines," Coastal Command Review, 1:4 (July and August 1942), 12-15, DHist 181.003 (D963), and "Distribution and Migrations of Whales in the North Atlantic," Coastal Command Review, 2:6 (October 1943), 34-37. The first of these articles contains several photographs of spouting whales taken by Coastal Command aircrew.

³⁵ The crew consisted of F/O L.C. Martin, pilot, F/O O.G. Solmundson, 2nd pilot, F/L A.G. Thomson, W.O.O., F/O W.C. Jackson, navigator, F/O J.W. Hart, W.O.O., Sgt. J.R. McConnell, W.A.G., WO2 W.L. Greer, W.A.G., S/F R.G. MacNeil, flight engineer, and Sgt. L.S. Bentley, flight engineer. F/L Thomson was an officer in the squadron's Radar Section.

operating in the same area afterwards also failed to spot any evidence of a ditched aircraft.

On 17 April the ORB noted that

to date no evidence of any kind has been found to give any possible explanation for the disappearance. It can only be assumed that it was something very sudden to give the crew no chance to make any kind of an emergency signal. On checking it was found that the enemy "met" [meteorological] aircraft from Norway generally operated in this same area, and it could possibly have attacked the Canso. As there is a strong possibility of enemy action being the cause of the accident, and as no other evidence is available to give any other explanation, it is considered that the loss is attributed to enemy action.³⁶

On 5 May a British ship found the bodies of F/L O.G. Solmundson and F/L A.G.

Thomson, but unfortunately the location of this incident is not entirely clear. The bodies, buried at sea, were identified by identity discs. The truth behind the disappearance of Canso "A" 11066 will likely remain one of the war's many unsolved mysteries.³⁷

A second aircraft was lost to the squadron on 19 April. Canso "A" 11076 had undergone a minor inspection at Scoudouc and was to be ferried to Iceland by a crew from 162 (BR).³⁸ After some minor problems were repaired, the aircraft flew to Moncton to take some equipment on board and weigh the aircraft. On 19 April, after weather had kept the Canso and its crew in Moncton for two days, good weather was forecast for the trip to Goose Bay and the aircraft took off for the five hour trip. When 11076 was approximately over Anticosti Island, the flight engineer informed the pilot that fuel was not draining properly from the starboard tank, and after attempts to rectify the problem failed, P/O Lahey decided to divert to the American base at Mingan, on the north shore of the St.

³⁶ 162 (BR) ORB, 3, 17 April 1945.

³⁷ The entry in the squadron's intelligence report mentions that the bodies were found "west of north" of the Westmann Islands, but this would have placed them within a few miles of the Icelandic shore. Furthermore, the Westmann Islands are off Iceland's south coast, and the Canso's assigned patrol area was to the northeast of the island. It is possible that they were found off Vestmanna in the Faeroe Islands, and this would be more consistent with the aircraft's assigned patrol area. *ibid.*, 20 May 1945; Weekly Intelligence Report No. 9 - No. 162 Squadron, RCAF, For week ending 23:59 hrs. Thursday, May 24th, 1945," 2, DHist 181.003 (D58). Unfortunately for researchers, it appears that 162 (BR) only began to file weekly intelligence reports with EAC HQ at the end of March 1945.

³⁸ The crew consisted of P/O B. Lahey, pilot, P/O A.C. Smith, 2nd pilot, F/O D.L. Munro, navigator, Sgt. G.J. Bunnell, 2nd navigator, P/O R. Sugden, WAG, P/O W.R. Taillefer, WAG, P/O E.W. Lambert, WAG, P/O W.R. Baggett, flight engineer, P/O G.E.R. Joy, flight engineer.

Lawrence. Traces of water were found in the fuel tanks, and after the fuel lines were drained the Canso resumed its trip to Goose Bay. About an hour into the flight, the aircraft was forced higher and higher by cloud tops that were building up, but when it reached 10,000 feet the starboard engine began acting up again. Attempts to rectify the problem were not successful, and the heavily laden aircraft steadily lost height, emerging from the clouds only a few hundred feet above the ground. At 1930Z a forced landing was made on a tree covered slope. None of the crew were injured, but the fuel tanks burst, drenching them and the aircraft with fuel. After about half an hour the crew re-entered the Canso in ones and twos to salvage equipment and rations left behind in the rush to abandon it. While P/O Lahey and P/O Baggett were inside, an explosion occurred which set the aircraft and their clothing on fire. Both suffered severe burns.³⁹

On the morning of 20 April, Goose Bay began to make enquiries about the overdue Canso and a search was quickly organized. Liberators from 10 (BR) and Cansos from 160 (BR) were called in from Newfoundland to participate. At 1820Z on 21 April, an American C-54 transport spotted mirror signals and smoke from a signal fire. Investigation revealed the wreckage of 11076 and six survivors, and supplies were dropped. The C-54 circled the site so that rescue aircraft, including two ski-equipped Noorduyn Norsemen, could home in. Both aircraft landed on Lake Avent, the closest landing area to the crash site. The two injured survivors were evacuated on the first Norseman, but the second aircraft, carrying the remainder of the crew, crashed on takeoff, fortunately without injury to anyone. The second Norseman made it to Mecatina on Lake Morhiban some thirty-five miles away, on 29 April after the ice refroze. Ice conditions, however, prevented aircraft from taking off with more than their original crews, and dog teams or snowmobiles were

³⁹ "Remarks of Investigating Officer," 23, NAC RG 24, vol. C-5933, file HQ.1100-110-76, "Aircraft:- Canso A - R.C.A.F. No. 11076". Robert L. Scheina, "The Helicopter's First Arctic Rescue," Naval Museum Aviation Foundation, March 1981, 60-65. The Canso's electrical system had not been switched off following the crash, and investigators concluded that a spark from a damaged or broken wire probably caused the fire.

unable to come to the rescue since the snow was rapidly turning to slush. Although they had supplies and were in contact with the outside world, the survivors faced the possibility of having to wait for the winter freezeup before they could be rescued. As a last resort, a United States Coast Guard helicopter was flown to Goose Bay in a C-54 and was used to ferry the survivors one by one to Morhiban, where ice conditions allowed the Norsemen to fly them to Goose Bay.⁴⁰

This was the first time that a helicopter had been used in northern conditions, and the machine acquitted itself well. Not only were the Americans interested in its performance, but Eastern Air Command pointed out that "a Helicopter for this Command would be a very valuable addition to the Air Sea Rescue organization."⁴¹ The helicopter did prove its worth, for it was over two months after the rescue before conditions allowed members of the RCAF's Accident Investigation Branch to visit the site of the crash. The survivors would have had to wait that long for rescue had a helicopter not been available. Unfortunately, the starboard engine had been so badly damaged by the crash and ensuing fire that the cause of its failure could not be determined by the investigators, although in all likelihood the crash had been caused by icing in the fuel system, which had not been properly drained and refilled when the Canso landed at Mingan.⁴²

⁴⁰ *ibid.*; "Remarks of Investigating Officer," 23, NAC RG 24, vol. C-5933, file HQ.1100-110-76, "Aircraft:- Canso A - R.C.A.F. No. 11076"; Goose Bay, "Weekly Intelligence Report for Period Ending 2359 Hrs. April 26/45," DHist 181.003 (D3568); 162 (BR) ORB, 22 April 1945; AOCinC, EAC to AFHQ, "Report on Crash of Canso 11076 Near Morhiban Range on Thursday [sic], April 19th, 1945," 3 May 1945, NAC RG 24, vol. 3412, file HQ.466-2-2. vol. 2, "Air/Sea Rescue Services - RCAF Aircraft Ditchings - Report on". Lahey and Baggett were eventually evacuated to Christie Street Hospital in Toronto, Ontario. "Weekly Intelligence Report No. 9 - No. 162 Squadron, R.C.A.F. for week ending 23:59 hrs. Thursday, May 24th, 1945," DHist 181.003 (D58).

⁴¹ Scheina, "The Helicopter's First Arctic Rescue," 64; AOCinC, EAC to AFHQ, "Report on Crash of Canso 11076 Near Morhiban Range on Thursday [sic], April 19th, 1945," 3 May 1945, NAC RG 24, vol. 3412, file HQ.466-2-2. vol. 2, "Air/Sea Rescue Services - RCAF Aircraft Ditchings - Report on".

⁴² AIB2 to C.I. Accidents, "Accident to Canso 11076 from 162 Sqdn. while enroute Mingan to Goose Bay 19 April 1945," 31 July 1945, NAC RG 24, vol. C-5933, file H.Q.1100-110-76, "Aircraft: - Canso A - R.C.A.F. No. 11076"; CAS to AOCinC EAC, "Accident to Canso 11076, 162 Sqdn. while enroute from Mingan to Goose Bay 19 April 1945," 2 August 1945, NAC, RG 24, vol.

While the rescue efforts for the crew of Canso 11076 were underway, 162 (BR)'s aircraft made more sightings off Iceland. On 21 April, F/L Guttormson and crew⁴³ had just completed their patrol in Canso 11033 when Guttormson sighted smoke 90° to port, ten miles away. Binoculars confirmed that the sighting consisted of a continuous succession of "bluish-white" smoke puffs headed in a northerly direction. Losing height, the Canso closed with the target, but at 1,000 yards range the smoke ceased and their point of origin could no longer be seen. Although the ASD-1 radar had been switched off because the Canso was leaving its patrol area, the one member of the crew who was fully trained had been operating the equipment for the last hour of the patrol and had reported no contacts. The Canso reached the location of the sighting, fixing its position with Loran, and the crew could still see the smoke and although the wake had disappeared a disturbance seemed to indicate the recent submergence of some object. A sonobuoy and a marine marker were dropped on the disturbance, then Guttormson throttled back the Canso's engines, made a tight turn to starboard, and approached the suspected target along its course and travelling in the same direction ("up-track"). At 90 knots from 150 feet, two Mark 24 Mines were released, one landing on the disturbance and the other some 200 yards further on. Forty-five seconds had passed since the object emitting smoke had been seen.⁴⁴

3277, file HQ.235-9-3/2, "Accidents by Command - Accidents Investigation Branch - Eastern Air Command".

⁴³ The crew consisted of F/L Guttormson, pilot, WO2 D. Silver, P/O R.G. Murphy, P/O W.A. Gibson, P/O W.A. Condy, WO1 J.P.R. Bellemare, WO2 W.H. McCowan, WO2 A.N. Ragan, and Sgt. C. Clarke.

⁴⁴ "Precis of Attack by Canso Aircraft "R" of 162 Squadron," Assessment Committee Serial No. M.32, NAC RG 24, vol. 5211, file HQS.17-162-9, "No. 162 BR Squadron: - Operations -". By 1 April 1945 the tactics for all of 162's Cansos on sweeps was to carry two Mark 24 Mines and no depth charges. According to the Secret Devices officer, this doctrine had been adopted shortly before this date. SD Officer, 162 (BR) to CO, RCAF Station Dartmouth, 1 April 1945, DHist 181.009 (D3492). The adoption of these tactics was undoubtedly influenced by a Group Commanders' Conference at Coastal Command Headquarters on 31 January, when it was decided that since the Mark 24 Mine offered such good chances of success against schnorkelling U-boats, it should be adopted as the standard weapon for use against them. Air Ministry, "The RAF in Maritime War," V, 200-201. Early 1945 figures from ASWORG (the American OR agency concerned with ASW) calculated that using a second Proctor unit increased the probability of a hit on a schnorkelling U-boat by approximately 50%. While the carrying of a second Proctor unit by 162's Cansos meant that the three 250 lb. depth charges were not carried, additional figures from

Nothing further was seen of the mines and only the usual background noises were heard on the sonobuoy, but six minutes after the attack a patch of bluish smoke was observed some two and a half miles away along the object's assumed track. When the Canso closed in, the smoke was still visible, but the crew did not observe any definite puffs. Four sonobuoys were dropped, one of which gave periods of steady beats punctuated with interference over a period of about five minutes. While the Canso was circling the buoys, a Liberator was seen in the area, but attempts to establish R/T contact were unsuccessful. The 53 Squadron Liberator joined in the search, however, and postwar records discuss its participation. After L/53 dropped sonobuoys, cavitation swish and beats were heard by its crew, and one buoy finally picked up loud beats at about 110 per minute. At 1614, an attack was made with one Mark 24 Mine, but no explosion was heard, although the noises continued until 1750 hours. At 1629 hours, just over one and a half hours since the sighting, signals were sent by Canso 11033 to Flying Control, and ACHQ Iceland recalled it to base. After maintaining position over the area until 1700 hours, a course was set for Reykjavik. The Admiralty Assessment Committee assessed this attack as "U-boat present - No damage." Postwar reassessment based on examination of German records revealed that no U-boat had been within 120 miles of this sighting. Once again, whale spouts had provided the initial sighting of "smoke" and the various beats and noises detected by the sonobuoys were made by whales moving underwater.⁴⁵

ASWORG gave a very low probability of scoring hits on a schnorkelling U-boat using depth charges, so trading the three depth charges for an additional Proctor unit was reasonable. Memorandum, DofS/ST.6 to D/Ops, "Status of Proctor and Related Equipment in U.S.A.," 3-4, 20 February 1945, DHist 181.009 (D4897) vol. 1.

⁴⁵ "Precis of Attack by Canso Aircraft "R" of 162 Squadron," Assessment Committee Serial No. M.32, NAC RG 24, vol. 5211, file HQS.17-162-9, "No. 162 BR Squadron: - Operations -"; Air Ministry, "The RAF in Maritime War," V, app. VI, 28. Since the Mark 24 Mine was a passive acoustic homing torpedo, it was designed so that it would not generate noise that would interfere with its homing. As a result, its motor could not be heard on sonobuoys unless it was very close to them. Coastal Command, "General Instructions for the Operational Use of the Mark 24 Mine," 3-4, 27 February 1945, DHist 181.009 (D4897), vol. 2. By March of 1945 the Germans were aware of the sonobuoy and instructions were issued that U-boats suspecting the use of sonobuoys by aircraft were to dive deep and proceed very slowly on electric motors for at least fifteen hours.

Three days later F/L Guttormson and crew,⁴⁶ this time in Canso 11097, made a sighting at a range of about two miles while on a patrol south of Iceland. A line of greyish smoke some 150 yards long hung low over the water and dispersed as the aircraft approached. One of the crew reported a black vertical tube emerging from the sea at the head of the line of smoke, and a sonobuoy pattern was dropped. No results were obtained, and since the aiming point had been lost, no attack was made. Postwar analysis revealed that no U-boats had been within 150 miles of this position, and that the object sighted by the crewmember had probably been an expended smoke marker dropped by another aircraft. Aircrew in other squadrons made similar mistakes; the same day, Sunderland F/423 attacked another smoke marker with six depth charges. Another of 162's aircraft was involved in the hunt for a submarine on 24 April, but this time the target may have been *U-979*, which had recently arrived off Reykjavik, as discussed below. Flying Officer Chubb and crew,⁴⁷ on a training flight in Canso 11093, were called upon to co-operate with a naval force attacking a suspected U-boat some seven miles to the west of Skagi Light, but the aircraft made no attack.⁴⁸

On 26 April 162 (BR) made its final sighting before the end of the war. F/O Chubb and crew, who had been called upon to help with a submarine hunt only two days before, were carrying out a patrol south of Iceland. Visibility was clear except for occasional patches of cloud stretching down to sea level. Suddenly, smoke puffs were seen at 200 yards, coming from a dark dome shaped object with waves breaking over it. Several of the crew saw this object and F/O Chubb claimed that a short vertical aerial was visible on top

Furthermore, schnorkelling was only to take place at night. Air Ministry, "The RAF in Maritime War," V, 218.

⁴⁶ The crew was slightly different this time, and consisted of F/L J.K. Guttormson, WO2 D. Silver, F/O T.R. King, P/O R.G. Murphy, P/O W.A. Condy, WO1 J.P.R. Bellemare, WO2 W.H. McCowan, WO2 A.N. Ragan, and Sgt. C. Clarke.

⁴⁷ The crew consisted of F/O Chubb, pilot, P/O A.E.G. Swift, F/L C.T. Saunders, P/O H.E. Hughes, P/O J.R. Neal, P/O R.G. Garrard, P/O W.A. Gibson, P/O W.C. Fenn, Sgt. R.V.H. Gordon, and F/O A.A. Drackley.

⁴⁸ Air Ministry, "The RAF in Maritime War," V, app. VI, 28; "Weekly Intelligence Report No. 5 - 162 Squadron, R.C.A.F. For week ending 23:59 hrs. Thursday, April 26th, 1945.

of the dome. No contact was made on the ASD-1 radar, suggesting that the object had just surfaced and was too close to register, being lost in the sea return. Any attempt to attack was foiled by a brief snowstorm which enveloped the Canso. By the time the aircraft emerged from the storm, all evidence of the object had vanished and no evidence of its presence could be detected on sonobuoys. Unfortunately, the authenticity of this sighting did not hold up under postwar research. No U-boat had been within 110 miles of the sighting, which had probably been a whale that was surfacing to spout. The aerial was probably the product of wishful thinking and the frustration and boredom caused by a lack of real targets or tangible results of the patrols being flown.⁴⁹

Canso 11093's participation in a U-boat hunt on 24 April was the result of the last U-boat to operate off Reykjavik. Three submarines, *U-905*, *U-1106*, and *U-979* left for patrols in this area during March, but only the third had survived. Leaving base on 29 March, *U-979* arrived on 18 April. In the meantime, two more U-boats left for patrol areas off Reykjavik before the end of the war. The first, *U-486*, sailed on 7 April but was sunk off Bergen on the 12th by the British submarine *Tapir*. The second, *U-637*, left on 23 April only to return to base five days later. Although *U-979* arrived off Reykjavik on 18 April, no attacks were made until 2 May, when she sank the anti-submarine trawler *Ebor Wyke* (348 tons) just north of Skagi Light. On the night of 4/5 May, *U-979* attacked convoy RU 161 some twenty miles northwest of Reykjavik, damaging the *Empire Unity* (6,386 tons). Canso C/162 was providing escort at the time and saw the explosion from some three miles away, but made no sightings or contacts either before or after the attack. Shortly after the attack, *U-979* was moving at periscope depth when she collided with an A/S trawler and damaged her flak guns and the aerial on her schnörkel. Escaping the

⁴⁹ Once again, other aircraft had made similar mistakes. In fact, Liberator N/224 had made a false schnorkel sighting on the 26th to the east of the Faeroes. In this case its 3 cm ASV had actually obtained a contact on a spouting whale. Air Ministry, "The RAF in Maritime War," V, app. VI, 30; "Weekly Intelligence Report No. 5 - 162 Squadron, R.C.A.F. For week ending 23:59 hrs. Thursday, April 26th, 1945.

counter-attacks, *U-979* began the return trip to Germany, only to be lost after the surrender when she grounded off the Dutch coast on 23 May.⁵⁰

The attack that damaged the *Empire Unity* on 4 May was among the last made by U-boats during the Second World War. That same day, all U-boats at sea were ordered to cease hostilities and return to base. Five days later, they were ordered to surface, fly a black flag, and surrender to Allied forces instead. The end of the war in Europe on 8 May did not bring an end to 162's patrols, however. There were concerns that not all U-boats would surrender, so convoys and air patrols continued. Late on 10 May F/O R.L. Clarke and crew,⁵¹ flying Canso "A" 11074 spotted a fully surfaced Type IX U-boat in position 61° 56'N 10° 35'W. Since the boat "appeared to be obeying surrender instructions in good faith" the Canso took no offensive action, but communicated using signals in German, French, and English. The surrendering boat was almost certainly *U-1231*, which surrendered at a port in the United Kingdom shortly thereafter, and it was the only U-boat to surrender to an Iceland-based aircraft. Unfortunately, pictures taken by the Canso did not turn out because of low light conditions.⁵²

On Monday, May 7th, W/C Sully, the squadron's OC, had held a muster parade and outlined plans which included a squadron smoker and victory dinner to celebrate VE day. In order to prevent RCAF personnel from participating in any "rowdiness" that might take place in Reykjavik during victory celebrations, all personnel were to be confined to

⁵⁰ *U-1106* was sunk by Liberator O/224 in the Northern Transit Area on 29 March, but the fate of *U-905* is less certain. According to Tarrant, she was lost to air attack in the Northern Transit Area on 20 March, but Franks states about this attack that "it is now known that it was not *U-905*, but the identity of the submarine attacked is not certain." Tarrant gives the identity of the U-boat dispatched to Reykjavik on 7 April as *U-4806*, which is obviously a typographical error, since *U-4806* was cancelled and scrapped while incomplete. Franks, Search Find and Kill, 58; Tarrant, The Last Year of the Kriegsmarine, 200-203, 228, 235, 242-243; Air Ministry, "The RAF in Maritime War," V, 237-238, Maps 53, 55; Roskill, The War at Sea, III, pt. 2, 300, 302.

⁵¹ The crew consisted of F/O R.L. Clarke, WO2 R.H. Bailey, P/O F.D. Barrett, WO2 H.A.C. Coleman, Sgt. T.C. Comery, P/O W.A. Gibson, Sgt. M. Stringer, F/S J.F.A. Legault, WO2, E.H. Knuff.

⁵² 162 (BR) ORB, 11 May 1945, Summary for May 1945; "Weekly Intelligence Report No. 7 - No. 162 Squadron, R.C.A.F. For week ending 23:59 hrs. Thursday, May 10th, 1945," DHist 181.003 (D58).

base for forty-eight hours from 2359 hours on the 7th onwards. This was a wise decision, since rioters, including military personnel, caused serious property damage in Reykjavik on the nights of 8 and 9 May. Continuing disturbances on the 9th and 10th caused personnel to be confined to camp until 0900 hours on the 11th. The ORB noted that during the disturbances, "the City of Reykjavik enjoyed much celebrating and events led to almost a second Halifax show, but police by use of tear-gas managed to keep damage confined to broken windows and 'heads'," and that

the fact that members of this squadron were not involved will raise them still higher in the esteem of the Icelandic people who have come to have a high regard for Canadians because of their friendliness and exemplary behaviour. It was noted that the action of the Officer Commanding in confining all members of the Squadron to the camp area during the V.E. Day celebrations met with the hearty approval of all those affected. The comments by the Reykjavik Press on the Victory Celebration disorders were fair and restrained. Every newspaper observed that the celebrations would have been most enjoyable had it not been for the ill considered acts of a few misguided military men and Icelandic youths who indulged in violence and vandalism.⁵³

While the squadron was confined to base, a new arrival was beginning his job. On 3 May, F/L C.F. Schaefer, a Canadian war artist, arrived by Liberator from Goose Bay along with other personnel. Schaefer was assigned to the squadron for two months to make historical sketches. Flight Lieutenant Jonason, the squadron's Intelligence Officer, made contacts with local artists for Schaefer so that he could study their treatment of the Icelandic landscape. Schaefer's task became especially important as the squadron's return to Canada seemed more and more likely through the month of May. The last available intelligence report for Reykjavik notes that "F/L Schaefer has been prosecuting his work with vigor and enthusiasm and to date has some very creditable work finished which will be of real historic value when the history of this squadron is finally written."⁵⁴

⁵³ *ibid.*; 162 (BR) ORB, Summary for May 1945, 7-13 May 1945. For an account of the rioting in Reykjavik by a Canadian serving with 251 Squadron, the RAF meteorological unit in Iceland, see Ted Barris and Alex Barris, Days of Victory: Canadians Remember, 1939-1945, (Toronto: Macmillan Canada, 1996), 204-206.

⁵⁴ 162 (BR) ORB, 3 May 1945; "Weekly Intelligence Report No. 6 - No. 162 Squadron, R.C.A.F. for week ending 23:59 hours, Thursday, May 3rd, 1945"; "Weekly Intelligence Report

Although the U-boats had officially surrendered, 162 (BR) continued its patrols and convoy escorts, and there were still some interesting encounters. On 12 May, 162 returned a favour to 330 Squadron, which had played an important role in the rescue of F/L Hornell and crew in June 1944. Flight Lieutenant J.K. Guttormson and crew⁵⁵ in Canso "A" 11075 were flying an anti-U-boat patrol when they were diverted to search for a Sunderland from 330 Squadron that had ditched in position 61° 08'N 09° 05'W. The Sunderland had been forced down for unknown reasons and had damaged the float on its starboard wing. Nine men were seen standing on the port wing, apparently to keep the other wing from dipping into the water and capsizing the flying boat. After locating the Sunderland, the Canso returned to a trawler that had been spotted while homing in on the downed aircraft and attempted to attract the attention of the vessel. In the end, a written signal had to be dropped in a floating sea marker, after which the trawler set off to the rescue. In the meantime, an ASR Warwick had arrived but did not drop its Airborne Lifeboat because the trawler was already on its way. When it arrived near the Sunderland, the aircraft's crew launched their dinghies and were picked up by the trawler, which then set course for the Faeroe Islands, after which the Warwick left. About half an hour later, the Canso received a message instructing it to have the trawler take the Sunderland in tow and proceed to Thorshavn, in the Faeroes. Once again, a message canister had to be used, and when 11075 reached its prudent limit of endurance (PLE) and set a course for base, the trawler was returning to the Sunderland, escorted by another ASR Warwick that had recently arrived.⁵⁶ Also out of the ordinary was the search for a missing fleet tender on 28

No. 10 - No. 162 Squadron, R.C.A.F. for week ending 23:59 hours, Thursday, May 31st, 1945," DHist 181.003 (D58).

⁵⁵ The crew consisted of F/L J.K. Guttormson, WO2 D. Silver, F/O T.R. King, P/O W.A. Condy, F/O A.A. Drackley, WO2 W.H. McCowan, P/O W.A. Gibson, WO2 G.W. King, F/S C. Clarke.

⁵⁶ "Weekly Intelligence Report No. 8 - No. 162 Squadron, R.C.A.F. for week ending 23:59 hrs. Thursday, May 17th, 1945," DHist 181.003 (D58). This flight completed Guttormson's tour of operations with 162 (BR), during which time he had been F/L MacBride's co-pilot during two attacks on U-boats. He had also made one attack and one sighting during April 1945 as captain of his own crew. *ibid.* Guttormson eventually received the DFC in recognition of his efforts.

May. *FT2* was overdue from a sweep along the northeast coast of Iceland, and was eventually located in Thistil Fjord (see Map 3). After suffering engine failure, it was in serious difficulty, but F/L A.W. Pavey and crew⁵⁷ in Canso "A" 11039 located the vessel and allowed the navy to come to its rescue.⁵⁸

The same day, the Admiralty and the United States Navy announced that beginning at 0001 Greenwich Mean Time on 29 May, no further convoys would be sailed, and that "merchant ships by night will burn navigation lights at full brilliancy and need not darken ship." On 30 May the waters within range of Coastal Command's Iceland Group were declared clear of enemy submarines and 18 Group sent its last Form Green, which ordered that patrols be carried out, to 162 (BR). This last operational order from Coastal Command was recorded in the squadron's ORB:

- 30th May. (1) One Canso to carry out A/U Patrol Cross Over (8)
(2) Aircraft to be on patrol 311400B.
(3) We will be covering same area with one Catalina from 311200B till 312100B.
(4) In this our last Green to you we send our greetings and thanks for your excellent work in the past and every good wish for the future.⁵⁹

Canso "A" 11074 took off on the squadron's last patrol from Iceland on 31 May. Flying Officer R.J. Mills and crew⁶⁰ completed an uneventful anti-U-boat sweep lasting just over twelve and a half hours. The ORB noted that "with the completion of our operational work all interest and energy is now directed towards the Squadron movement back to Canada. Everyone is eagerly awaiting the arrival of our movement order."⁶¹

⁵⁷ The crew consisted of F/L A.W. Pavey, F/L D.J. Draper, P/O J.G. Gallagher, WO2 M.L. Truitt, WO2 J.M.A. Boyle, F/S H. Schwartz, F/O M.H.R. Johnston, P/O W.J. McKee, WO2 J.M. Mackie.

⁵⁸ "Weekly Intelligence Report No. 10 - No. 162 Squadron, R.C.A.F. for week ending 23:59 hrs. Thursday, May 31st, 1945," DHist 181.003 (D58).

⁵⁹ 162 (BR) ORB, 31 May 1945.

⁶⁰ The crew consisted of F/O R.J. Mills, F/O H.N. Thom, P/O R.G. Murphy, P/O H.R. Pickford, WO1 F.H. Banks, F/S A.G. King, WO1 H.N. Smyth, F/S D.K. Gate, F/S J.R. Brackney.

⁶¹ 162 (BR) ORB, 31 May 1945, Summary for May 1945.

The war against the U-boat was over, but it had been a close-run thing. Although the inshore campaign had never inflicted losses that threatened Allied merchant shipping the way that the wolf packs had, escorts and airpower proved unable to deal conclusively with U-boats operating inshore. Even with their limited effectiveness, the conventional boats equipped with schnorkel tied down tremendous Allied anti-submarine resources. On 4 May 1945 there were forty-five U-boats in the Atlantic area, thirty-five of which were in the waters surrounding the British Isles. These thirty-five boats were tying down some 400 anti-submarine vessels and 800 aircraft.⁶² As the actions off Reykjavik in the final week of the war demonstrated, U-boats were still able to operate undetected until they made an attack. The limited underwater mobility of the conventional boats, however, meant that any attack usually exposed them to immediate counterattack by surface escorts. "Once they hit a target," Peyton-Ward notes,

it provided a known datum point for an immediate retributive surface craft hunt. Hence the importance of adequately escorted convoys and the danger of routing ships independently even in inshore areas. The lesson had been learned in mid-ocean warfare early in 1943, but its application to inshore waters was not complete until February 1945 when the tit for tat sequence of a ship sunk followed by the U-boat sunk became almost monotonous.⁶³

In inshore waters during February, twelve U-boats had been destroyed and eleven merchant ships and three naval vessels lost. During the following month, fifteen submarines were sunk in return for the loss of ten merchant ships. Three naval vessels were sunk during March and another damaged.⁶⁴

By the last five weeks of the war, Allied anti-submarine forces were inflicting greater losses on U-boats operating inshore. Twenty-three were sunk in the waters around the British Isles, while five were sunk in mid-Atlantic and four off the American coast. In return, thirteen merchant ships were sunk and seven damaged, a poor return for German

⁶² Air Ministry, "The RAF in Maritime War," V, 231; Milner, *The U-Boat Hunters*, 255. Milner gives the number of U-boats either on station in UK inshore waters or on passage to or from such billets on 5 May as twenty-five.

⁶³ Air Ministry, "The RAF in Maritime War," V, 109.

⁶⁴ *ibid.*, 218, 231.

efforts. Even with these losses, however, it should be remembered that some forty-five U-boats were still at sea on 4 May, and that in the British Isles alone, considerable anti-submarine forces were tied down by these few boats.⁶⁵ Losses on such a scale defeated the inshore campaign conducted by the old U-boats in the German fleet in early May 1945.

Hessler notes that

When, after the capitulation, the Allies ordered all boats to report their positions, many failed to respond, and it was only then that the magnitude of our losses in the last month of the war became apparent. . . . The real situation, as now revealed, was infinitely worse than we had feared and, had the war not terminated on 9th May, we should without doubt have been compelled to withdraw all the remaining old-type boats from the Atlantic. Such severe losses might not have seriously affected the morale of the crews of the new-type boats, but the U-boat arm could not have endured them for another month.⁶⁶

While the “old-type boats” to which Hessler refers -- the conventional U-boats equipped with schnorkel -- would have been withdrawn, the “new-type boats” were a different matter. Type XXI and XXIII U-boats had just begun to enter service. The first of the latter kind, a small boat meant for inshore work, sailed on operations on 29 January. Although *U-2324* failed to sink any ships on her patrol due to technical difficulties, the patrol demonstrated that the Type XXIII was well-suited to inshore operations.⁶⁷

Five more Type XXIII U-boats entered service before the end of the war, and they carried out a total of eight patrols, sinking five ships totalling 8,542 tons, and damaging a sixth of 7,209 tons. Apparently, none were detected while on patrol. Only one of the larger and more capable Type XXI U-boats ever entered active service; on 30 April 1945 *U-2511* sailed from Bergen. Shortly after receiving the order to cease hostilities, a British cruiser, *HMS Norfolk*, with destroyer escort was sighted, and the submarine carried out a mock attack and escaped without being detected.⁶⁸ The experiences of these U-boats gives

⁶⁵ *ibid.*

⁶⁶ Hessler, *U-Boat War in the Atlantic*, III, 97-98.

⁶⁷ Air Ministry, “The RAF in Maritime War,” V, 204; Tarrant, *The Last Year of the Kriegsmarine*, 192.

⁶⁸ Air Ministry, “The RAF in Maritime War,” V, 209, 213, 218, 225-226, 238; Tarrant, *The Last Year of the Kriegsmarine*, 195-207; Hessler, *The U-Boat War in the Atlantic*, III, 98-99; Rohwer,

some indication of the problems Allied forces would have faced in dealing with them. Germany had been defeated just in time to avoid the long-anticipated offensive by the new U-boats that might well have had serious consequences for shipping and resulted in the diversion of resources from the main Allied operations in Europe and the Pacific. Admiralty estimates of shipping losses from a renewed offensive using both the new and the old types of U-boats were between seventy and ninety ships a month by mid-1945, compared with the sixty ships a month lost during the worst period of the Battle of the Atlantic during spring 1943. Victory had truly come just in time.⁶⁹

With the end of the U-boat threat in the waters around Iceland, 162's return to Canada seemed imminent. Movement orders had been under discussion since just before the end of the war, and were far less complicated than the discussions that led to the squadron's posting to Iceland in January 1944. On 7 May Air Force Headquarters in Ottawa had contacted RCAF Overseas Headquarters in London, asking them to enquire when the Air Ministry would be prepared to release the squadron from its present operational commitment. A reply was received on the 12th, stating that the Ministry expected to be able to release the squadron on 1 June, and that a definite decision would be reached in two days' time. In any event, Overseas Headquarters suggested that the details of the move be arranged between Coastal Command and Eastern Air Command. In reality, the decision was not so quickly arrived at, and the matter was not formally discussed with the Air Ministry until 14 May. The previous discussions that had led to a tentative date of 1 June for the end of 162's commitment had been held between the RCAF Liaison Officer at

Axis Submarine Successes, 191-195. While Tarrant claims two Type XXIIIs (*U-2322* and *U-2321*) sailed on operations during February, Peyton-Ward states that only one (*U-2322*) did so. Most of the sources, with the exception of Rohwer, omit some of the sinkings made by Type XXIII U-boats. The table in Hessler's work contains some errors as well. Although most sources claim that no Type XXIII U-boats were detected while on patrol, Peyton-Ward mentions two possible sightings of *U-2324* and *U-2326* by Coastal Command aircraft. Air Ministry, "The RAF in Maritime War," V, 238-239.

⁶⁹ See Roskill, The War at Sea, III, pt. 2, 289-291; Air Ministry, "The RAF in Maritime War," V, 197-198, 201-203 for British appreciations of the threat posed by an offensive using the Type XXI and Type XXIII U-boats.

Coastal Command Headquarters and the Command's Senior Air Staff Officer (SASO), but the Air Ministry, in conjunction with the Admiralty, would have to confirm the date. The matter was taken under consideration by the Air Ministry, Coastal Command, and the Admiralty. On 23 May RCAF Overseas Headquarters were notified that approval had been given for the release of 162 (BR) from its operational commitments as of 1 June 1945. Details of the move were to be arranged between Coastal Command and Eastern Air Command.⁷⁰

The squadron was to be prepared to move from Reykjavik to Sydney, Nova Scotia, via Goose Bay, Labrador, on 7 June. As with the move to Iceland, the Cansos were to carry a full crew as well as as many groundcrew as could safely be carried in the aircraft. The remainder of the squadron personnel were to be evacuated by Liberators of 168 (HT) Squadron, and a small group of personnel was to be left in Reykjavik until all of the unit's equipment could be shipped to Canada. The first signals were sent from Ottawa on 1 June, and that night at the squadron smoker W/C Sully announced that AFHQ intended to move the squadron to Sydney during the month. "A most favourable response was received to this news," the ORB recorded. Rumours had already been circulating that the squadron was to return to Canada, especially since complete checks of all squadron inventories had already been made. On 2 June EAC contacted the squadron, wanting to know if there were sufficient crews to ferry the Cansos from Reykjavik to Sydney, and the signal from Ottawa about the impending move also arrived. Appropriately, that night "Thin Man Goes Home" was shown in the squadron theatre.⁷¹

⁷⁰ AFHQ to ROYCANAIRF, London, signal AX.43, 7 May 1945; AFHQ to ROYCANAIRF, London, signal A.626, 12 May 1945; AOCinC, RCAF Overseas, to Under Secretary of State, Air Ministry, "Return to Canada of No. 162 (BR) R.C.A.F. Squadron," 14 May 1945; DOps (Maritime) to AOCinC, RCAF Overseas, "Return to Canada of No. 162 (BR) R.C.A.F. Squadron," 14 May 1945; DOps (Maritime) to AOCinC, RCAF Overseas, "Return to Canada of No. 162 (BR) R.C.A.F. Squadron," 23 May 1945, DHist 181.006 (D312). On 25 May EAC contacted 162 (BR) and asked them to contact the RAF to find out if they were interested in taking over any or all of the RCAF equipment. 162 (BR) ORB, 25 May 1945.

⁷¹ AFHQ to EAC, (R) ROYCANAIRF, CCHQ, 162 (BR), signal AX.2539, 1 June 1945; "WHO Movement Order No. 2: Movement of No. 162 (BR) Squadron from Reykjavik, Iceland to Sydney,

The squadron was busily engaged in taking inventories and packing during the following days, and the Cansos were being readied for their departure on the 7th. The day before, however, F/O Davis and crew⁷² were withdrawn from the movement order and took Canso "A" 11081 to Northolt, England, so the aircraft could be inspected and its suitability for Air-Sea Rescue work ascertained. This last detachment has the appearance of an afterthought on the part of the Air Ministry. On 4 June, just three days before 162's departure, they contacted Eastern Air Command and other organizations. The suitability of Catalina amphibians for Air-Sea Rescue was being examined, presumably for the campaign against Japan in the Far East, and decisions would be more easily reached if such an aircraft could be examined. Although 162 (BR) was about to return to Canada, no unit nearer London was equipped with amphibious Catalinas, so the Ministry would be "most grateful" if one of the squadron's Cansos could be flown to Northolt for inspection. Eastern Air Command agreed immediately, and the squadron was notified, so on 7 June, when twelve Cansos left Reykjavik for Goose Bay just after midnight GMT, a thirteenth headed in the opposite direction, arriving in England after just over eleven hours in the air. This was the last of 162's operational and local flights out of Reykjavik, Iceland. After eighteen months of operations from the land of fire and ice, the squadron was returning to Canada.⁷³

Nova Scotia," 1 June 1945, DHist 181.006 (D312); "Weekly Intelligence Report No. 8 - No. 162 Squadron, R.C.A.F. for week ending 23:59 hrs. Thursday, May 17th, 1945," 3, DHist 181.003 (D58); 162 (BR) ORB, 1-2 June 1945. Ironically, 162 did not receive a copy of the movement order until 19 June, by which time it was already in Sydney, but in light of earlier communication problems between Iceland and Canada, the delay is not entirely surprising. *ibid.*, 19 June 1945.

⁷² The crew consisted of F/O G.J. Davis, WO2 L.H. Strongman, F/O R.H. Wales, P/O D.K. Lynch, P/O D.J. Johnson, F/S C.G. Milne, P/O S.M. Sinclair, Sgt. R.J. Brockbank, and Sgt. J.H. Dobson.

⁷³ 162 (BR) ORB, 2-7 June 1945; Air Ministry to EAC, signal AX.408, 4 June 1945; HQ EAC to Air Ministry, signal AX.54, 5 June 1945, DHist 181.006 (D312). It is interesting to note that one of the staff officers at RCAF Overseas Headquarters was ordered to "watch for arrival. Meet the crew - monitor their visit and make arrangements for return of a/c to Canada." Minute, DAS to SOO, 7 June 1945, on *ibid.* The Canso and crew returned to Sydney via the Azores, arriving on the 26th. 162 (BR) ORB, 22-26 June 1945.

The twelve Cansos heading for Canada carried their crews and three passengers each, while nine Liberators from 168 (HT) squadron took off with up to twenty groundcrew each. A total of 287 personnel left Reykjavik on the 7th, while another 132 left on the 8th, taking the same Liberators that had transported their comrades the previous day. By then, 419 personnel had left Reykjavik for Sydney, where they were to be joined by other squadron members on leave in Canada. With the exception F/O Fuhrman and crew⁷⁴ in Canso 11039, who were kept in Goose Bay for a few days with undercarriage problems, all of the Cansos and personnel carried by Liberators arrived by 8 June. The ORB noted that "as 437 personnel of the Squadron are now in Canada it is generally quiet around Camp Maple Leaf." After W/C Sully and a party of 36 other personnel left for Goose Bay on 13 June, 46 personnel, designated 162 (BR) Detachment, Reykjavik, Iceland, remained as a rearguard to close up the camp and pack equipment for final disposal.⁷⁵

Another movement order had been issued by the time the Cansos arrived in Sydney on 8 June. Starting on the 15th, twelve of the squadron's aircraft were to be ferried from Sydney to Western Air Command. Nine Cansos were to be delivered to 4 (BR) Squadron in Tofino, British Columbia, while the other three were to be placed in Stored Reserve at Sea Island, BC. Since the movement order mentions the ASD--1 radar on several occasions, it was probably this equipment that led to the decision to transfer the Cansos to WAC for the ongoing war against Japan. Such an order was an obvious sign that the squadron would soon be disbanded, but four days later the order was cancelled. Although it may not be directly connected with the cancellation of the order, Eastern Air Command was maintaining two squadrons, the Liberator-equipped 10 (BR) at Torbay, and 162 (BR)

⁷⁴ The crew consisted of F/O A.J. Fuhrman, F/S S.A. Luciani, P/O W.J. Reville, P/O R.E. Potter, P/O L.R. Verhelst, P/O J.G. Berthiaume, F/S M. Cooper, P/O W. Muir, Sgt. G.H. Legge, and three unnamed passengers.

⁷⁵ 162 (BR) ORB, 7-14 June 1945. Unfortunately, neither the squadron's ORB nor any other records mention what happened to the personnel remaining in Reykjavik.

at Sydney, in case any “rogue” U-boats refused to surrender. While the precise reasons behind the choice of these two squadrons are unknown, they probably had to do with the quality of the squadrons’ equipment and their records against U-boats during the war. In any event, they were not needed as the threat did not materialize. Unfortunately, the RCAF official history gives neither the date of the decision to retain the two squadrons nor the date when the decision was taken to disband them, but since 162’s return to Canada was not decided until 23 May, the decision to retain it was probably not made much earlier than then.⁷⁶

The end of the war brought massive changes to Eastern Air Command. By 1 June 1 Group Headquarters in St. John’s had been closed down and six squadrons disbanded. One more squadron, 11 (BR), had been transferred to Western Air Command. These changes affected those units that remained, and 162’s ORB recorded in its June summary that “We were not quite prepared for the S.N.A.F.U. situation of the R.C.A.F. in Canada. It came as a shock at first. Gradually this shock wore off and now we struggle along from day to day not knowing what tomorrow will bring forth.”⁷⁷ The squadron’s day to day activities included familiarization flights to local bases and general training, as well as periodic drops of mail and supplies to radio personnel on St. Paul’s Island off the northern tip of Cape Breton Island. During the month of June 162 (BR) logged a total of just under 500 flying hours, about 300 of which were transit flights from Iceland to Canada. Because of the end of the war in Europe, the squadron was not pressed into service as it had been

⁷⁶ W.H.O. Movement Order No. 3: Movement of Aircraft of No. 162 (BR) Squadron from Sydney Nova Scotia to No. 4 (BR) Squadron Tofino, British Columbia,” 8 June 1945; “Amendment List No. 1 to W.H.O. Movement Order No. 3: Movement of Aircraft of No. 162 (BR) Squadron from Sydney Nova Scotia to No. 4 (BR) Squadron Tofino, British Columbia,” 12 June 1945, DHist 181.006(D312); Minutes from O3-2 and O3, 25 June 1945, on AOCinC EAC to AFHQ, “Establishment, Aircraft - No. 162 Squadron,” 18 June 1945, NAC RG 24, vol. 4953, file HQ.895-9/162, “Organization & Establishment: No. 162 Squadron”; Douglas, The Creation of a National Air Force, 398-399.

⁷⁷ *ibid.*; 162 (BR) ORB, Summary for June 1945. The polite interpretation of SNAFU is “Situation Normal, All Fouled Up.”

following its arrival in Iceland. In fact, the summary of service flying for June records no operational flights.⁷⁸

July saw more activity for the squadron, but also witnessed a final tragedy before its disbanding. On the 6th, F/O Olson and crew left for the airfield at Rockcliffe, near Ottawa, to engage in a photographic survey, stopping in Moncton to pick up equipment. Attached to No. 7 Photographic Wing at Rockcliffe, Canso 11023 was apparently to be used for a photographic survey of Baffin Land. But on 23 July, while practicing water landings on the Ottawa River near Aylmer, Quebec, it crashed and sank. Five of the crew were killed, while the two survivors, one of whom was a passenger from No. 12 Communications Squadron, were injured.⁷⁹ Flying Officer Olson was recommended for the George Cross, awarded for bravery, for his attempt to rescue F/O Murphy, who had been trapped in the sinking aircraft, but the award does not seem to have been made. Although the Canso was recovered from the river bottom, and an inquiry was presumably held, no accident inquiry records have yet been found, so the precise cause of this accident remains unknown.⁸⁰

The squadron's aircraft were more active in July, carrying out more local familiarization and training flights, as well as instrument flying practice and water landings at Sydney harbour. Organized survival courses, instrument flying courses, and practice in the Link Trainer occupied personnel on the ground. There were also familiarization flights for air cadets, additional mail drops on St. Paul Island, and training exercises. Once again,

⁷⁸ *ibid.*, 16-30 June 1945, Summary for June 1945, Summary of Service Flying, June 1945.

⁷⁹ P/O M. Olson, pilot, P/O R.G. Murphy, navigator, WO1 P.E. Bulley, WAG, WO2 S.W.R. Brown, WAG, and WO2 L.M. Whitehead, flight engineer, were killed in the accident, while F/O A.F. Gerding, pilot, and F/L J. Beattie, pilot, were injured. Beattie was a passenger and member of 12 Communications Squadron at Rockcliffe. Not all of the crew who left Sydney in Canso "A" 11023 on 6 July were on board when the crash occurred. Those not on board might have been either a second crew required for the photographic survey or personnel being transported in one of the squadron's aircraft.

⁸⁰ 162 (BR) ORB, 6, 23, 30 July 1945; RCAF Station Rockcliffe ORB, 23-29 July 1945, NAC RG 24, vol. C-12198; clippings from The Evening Citizen, Ottawa, Ontario, 23-29 July 1945, contained in Rockcliffe ORB. The only accident records that appear to be available for Canso 11023 at the National Archives cover an incident prior to its service with 162 (BR).

no operations were carried out by the squadron during July, but it logged a total of just over 370 hours' flying time, the vast majority of which was devoted to daytime training flights.⁸¹ Among the exercises carried out by 162 (BR) was training with the Royal Navy submarine *Unseen* based at Digby, Nova Scotia. Flying down to Yarmouth, the base where the squadron's existence had begun, the Cansos carried out exercises with the submarine, which had been fitted with a dummy schnorkel for this purpose. Shortly after the first Cansos left to carry out exercises with *Unseen*, another left for Dartmouth to practice against the real thing. On 16 July Canso 11056 flew to Dartmouth, where it carried out radar and other exercises against the surrendered *U-889*. These exercises were part of extensive tests carried out during June and July, and 162 was undoubtedly involved because the Naval Research Establishment in Halifax wanted to measure the performance of its ASD-1 radar and its sonobuoy equipment against a genuine schnorkel-fitted U-boat. One of 10 (BR)'s Liberators was also involved, presumably to test its radar and sonobuoys as well, but it should also be remembered that by the end of June there were only two Bomber Reconnaissance squadrons still operational with Eastern Air Command, and both of them were used in the trials.⁸²

At the beginning of the month, the squadron had been "comfortably settled at Sydney, but rather unsettled as to definite plans for future operations." Many aircrew and as many groundcrew as could be spared were released for disembarkation leave. Personnel who had been necessary during the squadron's stay in Iceland but who were supernumary to the regular organization and establishment of a Canso "A" Bomber Reconnaissance squadron in Canada were posted to other units, and extra ground personnel were

⁸¹ 162 (BR) ORB, July 1945, passim.

⁸² *ibid.*; Milner, The U-Boat Hunters, 204; AOCinC EAC to CO, RCAF Station, Sydney, NS, "Aircraft, Radar and RSB Trials with Submarine U-889 - Letter of Appreciation," 2 August 1945, DHist 181.002 (D236); Norman Friedman, U.S. Submarines Through 1945: An Illustrated Design History, (Annapolis: Naval Institute Press, 1995), 252. Friedman describes the Canadian report as "much more detailed" than the U.S. report of tests against *U-858*. *ibid.*, 356, n.36; Douglas, The Creation of a National Air Force, 398-399.

distributed amongst the station's sections, in accordance with the movement orders issued on 1 June. Many of the personnel remaining with the squadron volunteered for the "second phase" of the war, but the ORB noted that more would have volunteered had they been assured of a posting outside of Canada. Although the squadron was settling in at Sydney, its future remained uncertain. The end of the month, however, finally resolved the issue of the squadron's future.⁸³

The official order disbanding 162 (BR) was issued on 2 August 1945. "As a result of the successful conclusion of the war in Europe," it began, "and in view of the requirements of the war against Japan and the eventual organization of the post war air force, the continued operation of this squadron is no longer necessary. It is intended to disband 162 (BR) Squadron."⁸⁴ The squadron was to cease performing its functions as of 1 August 1945 and was to disband effective 7 August. Personnel were quickly occupied with inventory taking and turning in supplies, equipment, publications, and other material. During its last week of existence, the squadron's Cansos logged only five hours and forty minutes of flying. The final summary in the Operations Record Book stated simply that "The disbandment of No. 162 Squadron leaves a long career of 3 years of successful operation on the North Atlantic. To all the personnel it meant the end of one of the most colourful squadrons in Coastal Command, and one in which they have all been proud to serve."⁸⁵

Created in response to increased sinkings to the south and west of Nova Scotia in 1942, the detachment from 10 (BR) soon became a squadron in name if not in fact. During its three months as a 10 (BR) detachment and the first months of its existence, 162 (BR) suffered from a shortage of aircraft, followed by a shortage of aircrew. Movements to

⁸³ 162 (BR) ORB, Summary for July 1945; "WHO Movement Order No. 2: Movement of No. 162 (BR) Squadron from Reykjavik, Iceland to Sydney, Nova Scotia," 1 June 1945, DHist 181.006 (D312).

⁸⁴ "Secret Organization Order 277: Disbandment of 162 (BR) Squadron," 2 August 1945, DHist 181.009 (D5474).

⁸⁵ 162 (BR) ORB, 1-7 August 1945, Summary for August 1945.

various bases on the East Coast were in response to the changing U-boat offensive in the North Atlantic and in the St. Lawrence, but with the withdrawal of the wolf packs from the Atlantic in May 1943 162's future seemed uncertain. Eastern Air Command was oversupplied with Canso squadrons, and inter-Allied negotiations and redeployments of anti-submarine aircraft led to the squadron's movement to Iceland in January 1944. With the exception of a few Western Air Command squadrons that served in the Aleutians, 162 (BR) was the only Home War Establishment squadron to be based outside of Canada and Newfoundland during the Second World War.⁸⁶ Moreover, the squadron's move to Iceland was the first overseas movement of an RCAF squadron relying solely on Canadian resources, and the length of time taken to move all of the personnel demonstrated the need for long-range transport in the RCAF. These difficulties continued to be experienced with mail and transport service to Iceland, and with the supply of spare parts and maintenance equipment well into 1945. Coupled with the delays and difficulties experienced with servicing the squadron's Cansos in Canada, 162's experiences in Iceland demonstrated that until early 1945, without assistance from Allied forces, the RCAF could only maintain an overseas squadron with great difficulty. Canada's shortage of Liberator aircraft, vital for both mid-Atlantic anti-submarine patrols and for transport duties beyond the North American continent, was largely to blame for this problem. The RCAF was constantly struggling to procure these valuable aircraft from American sources, and although the attempts to obtain these aircraft for anti-submarine warfare have gained more attention, the importance of these aircraft for RCAF transport operations cannot be ignored. A failure to understand the difficulties of supplying a squadron's needs by air at the time the RCAF made its commitment to support 162 (BR) in Iceland was undoubtedly a further contribution to the squadron's difficulties.

⁸⁶ While several other Home War Establishment squadrons were posted to the British Isles during the war, they became part of the RCAF Overseas. Only 162 maintained its status as a part of the HWE throughout its posting.

June 1944 revealed the squadron's strengths and demonstrated what an RCAF squadron could accomplish under favourable circumstances. Operational training was not available in Canada, but was made available by Coastal Command and was coupled with an extensive training programme undertaken by the squadron. In conjunction with this training, the courage and determination of 162's aircrew allowed them to make the most of the opportunities they were presented in June 1944, when they recorded their memorable string of victories. These events demonstrated additional problems, however, as the inadequacy of the armament and safety equipment carried by Eastern Air Command's Cansos quickly became apparent. Although EAC had upgraded their forward-firing armament during late 1943, it was not equal to the task of suppressing anti-aircraft gunners on U-boats, and crews from 162 paid the price. The experiences of the crews who were forced to ditch after attacking not only demonstrated the consequences of inadequate armament but also that the safety equipment carried by 162's Cansos required improvement. The upgrading of the Cansos' armament in the months that followed provided them with a formidable punch, but by that time the enemy was rarely found on the surface.

The advent of the schnorkel, which allowed U-boats to operate entirely submerged, robbed anti-submarine aircraft of most of their effectiveness. The new pattern of submarine operations in inshore waters also meant that surface escorts faced considerable difficulties in hunting the enemy and that a campaign against Allied shipping could be sustained in the face of overwhelming anti-submarine forces. For 162 (BR) and other maritime patrol squadrons, the inshore campaign brought an end to their tremendous effectiveness against U-boats. The enemy had effectively vanished from the ocean. Between 4 August 1944, when two of the squadron's Cansos attacked and damaged *U-300*, and 10 May 1945, when the surrendered *U-1231* was sighted, 162 (BR) made no

genuine sightings of U-boats.⁸⁷ All seven sightings or attacks over this period were made on bogus schnorkel sightings. Such bogus sightings were a widespread phenomenon from September onwards, and the decline in genuine U-boat sightings caused by the introduction of the schnorkel contributed to these sightings as aircrew reacted to the lack of real targets or tangible results of the patrols being flown.

Three of these sightings by 162 (BR) were followed up with attacks using a new weapon and sensor: the Mark 24 Mine and the expendable radio sonobuoy. The squadron had been using the Mine, which was an air-dropped anti-submarine acoustic homing torpedo, since March 1944. The sonobuoy, which allowed aircraft to listen to underwater sounds that might or might not have been made by a submerged U-boat, was installed in 162's aircraft beginning in August 1944, and was used on several occasions during attacks on bogus sightings. Although the squadron did not score any successes against U-boats with this modern weapon and sensor, its fitting to 162's Cansos demonstrated that EAC was making efforts to keep its Bomber Reconnaissance aircraft up to date. Efforts to keep the radar on its Cansos up to date, however, met with less success. Equipment supply problems and inadequate facilities for installing the new equipment meant that 162 (BR) and other Canso squadrons were operating with the obsolete Mark II ASV long after other Allied air forces and even other EAC aircraft types had been equipped with more effective radar. Towards the end of the war, Eastern Air Command was unable to keep its aircraft up to date due to inadequate planning and facilities. By the time 162 (BR)'s Cansos were fully fitted with their new ASD-1 radar, the war was almost over.⁸⁸

With the war in Europe at an end, 162 (BR) returned to Canada, where Eastern Air Command was being disbanded at a tremendous rate. Plans to deliver its Cansos to a Western Air Command squadron were cancelled almost as soon as they were issued, and

⁸⁷ The sighting on 23 November by Canso 11090 might have been *U-300* proceeding on schnorkel, but was probably a willywaw. Air Ministry, "The RAF in Maritime War," V, app. VI, 6.

⁸⁸ Douglas, The Creation of a National Air Force, 602.

the squadron settled in at Sydney, Nova Scotia. By the end of June 1945 only two anti-submarine squadrons remained on Canada's Atlantic coast: 10 (BR) and 162 (BR). Retained in case some U-boats refused to surrender, they were fortunately not needed. By 7 August 162 (BR) was disbanded, and 10 (BR) followed suit eight days later. Eastern Air Command's war against the U-boat in the North Atlantic was at last over, and Number 162 (Bomber Reconnaissance) Squadron, Royal Canadian Air Force, had played an important role in this struggle.

Number 162 (Bomber Reconnaissance) Squadron, Royal Canadian Air Force, was one squadron in a Home War Establishment that peaked at a strength of nineteen in Eastern Air Command and thirty-nine across Canada. Its operations ranged across the North Atlantic from the Gulf of St. Lawrence to Norway. During thirty-eight months of operations, the squadron logged a total of 2,100 operational sorties lasting 22,856 hours as well as 7,541 hours of non-operational flying. Nine of its Canso "A"s were lost, three to enemy activity, five to accidents, and one to causes that remain unknown. Forty-two of its personnel were killed, thirty-four of them while on operations. Seventeen of the latter have no known grave. In an accomplishment unequalled in the RCAF, the squadron's Cansos sank five U-boats, shared in the destruction of a sixth and damaged a seventh. June of 1944 was the highlight of the squadron's operations, when five of these victories were scored. Three Cansos were lost in the attacks, however, and one of the pilots, Flight Lieutenant David Ernest Hornell, had been awarded the Victoria Cross, the Empire's highest award for valour. In addition to the Victoria Cross, only two of which were awarded to members of RCAF squadrons during the war, the personnel of 162 (BR) were also awarded two Distinguished Service Orders, two were made Members of the Order of the British Empire, sixteen received the Distinguished Flying Cross, three received the Air

Force Cross, four received Distinguished Flying Medals, one the British Empire Medal, and twenty-one were Mentioned in Dispatches.⁸⁹

Despite 162's record, neither it nor any of the other squadrons of the Royal Canadian Air Force's Home War Establishment were perpetuated in the postwar air force. After the end of the war the RCAF underwent a two-year period of demobilization. It then began the process of reorganization, and in early 1947 it announced that the squadrons that had served overseas would be perpetuated by the adoption of "400 series" squadron numbers. The five new Regular Force squadrons (412, 413, 414, 426, and 435) were all given numbers in the 400 series despite their previous designations. One of them, Number 164 (Transport) Squadron, had formed an essential part of Eastern Air Command during the war, but this was apparently irrelevant to the RCAF, and the unit was divided into Numbers 426 and 435 Squadrons. During the subsequent expansion of the RCAF the numbering of all new units conformed to this pattern. Despite their important role in the Battle of the Atlantic, and the exceptional records of such squadrons as 162 (BR) and 10 (BR), none of the squadrons from the Home War Establishment were ever perpetuated. The accomplishments of these squadrons were ignored, if not rejected, by the actions of the postwar RCAF.⁹⁰

The scale of the Battle of the Atlantic may seem so large that any single unit would be ignored and lost in the clutter, but unit histories should form an important part of the historical literature. They provide a bridge between the broad general studies and the personal reminiscences or "popular" unit histories. Michael Gannon noted in *Operation Drumbeat* (1990) that

German naval historian Michael Salewski has suggested that in order to understand the complex sixty-nine-month long Battle of the Atlantic, the battle on which, more than any other, turned the outcome of World War II, one might profitably study a

⁸⁹ Samuel Kostenuk and John Griffin, RCAF Squadron Histories and Aircraft, 1924-1968, (Toronto: Samuel Stevens Hakkert & Company, 1977), 68.

⁹⁰ *ibid.*, 144-149.

single heavily engaged U-boat, which “mirrored at once both the greater strategy of war and its everyday horror.”⁹¹

Gannon’s work is a study of such a heavily engaged U-boat, *U-123*, and histories of maritime air squadrons that participated in the Battle of the Atlantic can perform a similar role. Examining the historiography of air power in 1992, Kenneth P. Werrell called for a “new unit history,” stating that

quality work here will permit us not only to know better what actually occurred during the aerial campaigns, but also to bridge the present gap in the literature between the micro- and macro-studies, between the individual and crew accounts on one hand, and the overall views of campaigns or air force level units on the other. By mating this specific material with broader studies and overviews of the war, we can put the air war story into context. In short, we need to meld detailed operational history with broader technological, political, and social studies. Such a history, “the new unit history,” should consist not only of the traditional chronological narrative, but should include scholarly analysis.⁹²

Werrell was discussing the United States Army Air Force strategic bombing campaign in Europe, but his comments are equally applicable to the study of maritime air power in the Battle of the Atlantic. Although “macro-studies” in this area are few in number, and “micro-studies” even fewer,⁹³ a bridge between the two is necessary in order to gain a more complete understanding of this great struggle. Superficially, 162 (BR) may not have been typical of Eastern Air Command squadrons, as evidenced by its move to Iceland and

⁹¹ Michael Gannon, Operation Drumbeat: the dramatic true story of Germany's first U-boat attacks along the American coast in World War II, (New York: Harper & Row, 1990), xvii.

⁹² Kenneth P. Werrell, “A Case for a ‘New’ Unit History,” Air Power History, 39:1 (Spring 1992), 34-35.

⁹³ Overall studies of the Battle of the Atlantic with an emphasis on the role of air power include Air Ministry, “The RAF in Maritime War,” I-V; Douglas, The Creation of a National Air Force, ch. 9-17; Greenhous et. al, The Crucible of War, ch. 11, and ch.12-13 for anti-shipping operations. Sadly, individual and crew memoirs of this aspect of the struggle seem to be few and far between, and most seem to have taken the form of articles. Franks, Search Find and Kill, details successful attacks on U-boats by Coastal Command and is a valuable source of information, but by its nature it does not explain the context of these actions. Of the few examples of individual Canadian accounts, A/M Clare L. Annis, “Eastern Air Command Recalled,” in I’ll Never Forget: Canadian Aviation in the Second World War, (C.A.H.S. Publications, 1979), 60-66 and Leonard J. Birchall, “Trenton to Dartmouth: An Anecdotal account of flying in the RCAF 1937-1940,” The CAHS Journal, 23:5 (Summer 1985), 35-6, 54 are good representatives of the genre. Max Schoenfeld, Stalking the U-boat, examines the history of several United States Army Air Force anti-submarine units, placing them in context and providing insight into air power and the Battle of the Atlantic. Studies of similar United States Navy units would be a worthwhile addition to the historiography of the Battle of the Atlantic.

dramatic record against U-boats demonstrated. These aspects not only make its history more interesting, however, but also provide insight into inter-Allied relations and discussions of maritime air policy as well as the effectiveness of an Eastern Air Command squadron against U-boats when given Coastal Command training and the opportunity to engage the enemy. In everyday experiences of flying, maintenance difficulties, and responses to the changing patterns of the U-boat war, however, 162 may have had much in common with other units in the RCAF's Home War Establishment. Studies of other units would determine just how unusual 162's experiences might have been, and would provide additional insights into the history of air power in the Battle of the Atlantic and the role of the Royal Canadian Air Force in maintaining the essential lifeline across the ocean.

In early 1997, Number 162 (Bomber Reconnaissance) squadron has been disbanded for over fifty years, and the Cansos it flew have been retired for thirty-five. Although the squadron is not perpetuated in any way by the Canadian Forces, it has from time to time been commemorated by them and by the Canadian government. In June 1957 the RCAF Association decided to get air force approval for an official squadron badge, since none had been sanctioned during the squadron's existence. A badge was officially approved by Queen Elizabeth II in February 1960, bearing the motto *Sectabimur usque per ima* - We will hunt them even through the lowest deeps. The osprey on the badge "is a great fisherman and is used in this instance to allude to the war-time role of the squadron. The billets [blocks] indicate depth charges and could also refer to the six submarines sent to the bottom by the squadron. The barry wavy illustrates the ocean over which the squadron operated."⁹⁴ Two years after 162 received its badge, the RCAF decommissioned its last Canso "A". On Sunday, 8 April 1962, Canso 11089, which had served with the squadron in Iceland, was officially retired at Downsview airport in conjunction with a squadron reunion. After suitable ceremonies, presided over by Reverend R.H.N Davidson, one of

⁹⁴ "Number 162 Squadron Receives Recognition," The Roundel, March 1961, 26; Kostenuk and Griffin, RCAF Squadrons and Aircraft, 68.

162's Protestant Chaplains, the Canso's aircraft logs were presented to Group Captain Chapman, former Officer Commanding 162 Squadron, and the amphibian took off, making a low pass on its departure.⁹⁵

Almost twenty years passed before the squadron was again commemorated by the Canadian government and Canadian Forces. On 15 November 1981, the Canadian Post Office released a stamp honouring Flight Lieutenant David Hornell, VC, and less than a year later the new training centre for Aurora maritime patrol aircraft at Greenwood, Nova Scotia, was also named in Hornell's honour. Sixteen years later, the Canadian Warplane Heritage Museum in Hamilton, Ontario, acquired a Canso "A", which is to be restored to its 1944 condition and dedicated to the memory of Flight Lieutenant David Hornell, VC.⁹⁶ Fifty years after its disbandment, 162 (Bomber Reconnaissance) Squadron, Royal Canadian Air Force, may be gone, but it will not be forgotten.

⁹⁵ "Canso Decommissioning Ceremony held at RCAF Station Downsview in conjunction with 162 Sqd. Reunion on Sunday 8 April 1962," addendum to 162 (BR) ORB.

⁹⁶ "Stamp Honours VC Winner," Sentinel, 1979, issue 6, 25; "Aurora Acceptance Ceremony - Hornell Centre Dedication, CFB Greenwood 29 May 1980," 1, DHist 80/307; Flightlines: Canadian Warplane Heritage Museum News, 2, August 1996.

Appendix A

List of Known 162 (BR) Attacks and Sightings

<u>No.</u>	<u>Date</u>	<u>Location</u>	<u>Aircraft</u>	<u>U-boat</u>	<u>Assessment</u>	<u>Comments</u>
1	28/4/42 ¹	43° 08' N 67° 37' W	9749		"E"	
2	30/5/42 ²	43° 37' N 66° 25' W	9750		Sighting	
3	3/7/43 ³	44° 27' N 64° 02' W	R/162		Sighting	
4	22/2/44	61° 03' N 20° 10' W	A/162		"E"	
5	17/4/44	60° 23' N 29° 20' W	S/162	U-342	"B"	
6	3/6/44	63° 59' N 01° 37' E	T/162	U-477	"B"	
7	11/6/44 ⁴	63° 07' N 00° 26' E	B/162	U-980	"A"	
8	13/6/44 ⁵	64° 10' N 00° 11' W	B/162	U-480		Canso shot down

¹ Carried out by 10 (BR) Detachment, which later became 162 (BR). 2 of the aircraft's 4 depth charges did not release due to equipment problems.

² Possibly a submerged submarine. It was only sighted by one crew member and had disappeared by the time the aircraft had returned to the location. "Weekly Intelligence Report for RCAF Station, Yarmouth, N.S., 24-5-42 to 31-5-42," 1, DHist 181.003 (D307).

³ Canso was unarmed. The following day a Hudson from 31 OTU sighted and attacked a U-boat at 43° 37' N 64° 03' W. "RCAF EAC Monthly A/S Report for July, 1943, Appendices 'A' and 'B'," NAC, RG 24, vol. 11027, file CNA 7-21-2, vol. 2, "A/S Warfare Summaries & Reviews - EAC Monthly Report". While no mention of this sighting appears in the squadron ORB, the ORB and Weekly Intelligence Report for RCAF Station Yarmouth for this date confirm the sighting. The attack by the Hudson was later assessed as "insufficient evidence of the presence of a submarine."

⁴ Photographs taken were apparently the first of a schnorkel installation on an operational U-boat. Plate 2, Coastal Command Review, 3:6 (June 1944).

9	13/6/44	62° 45' N 02° 59' W	T/162	U-715	"A"	Canso shot down
10	15/6/44	~61° 30' N 01° 00' W	O/162	Ju-88	Sighting	
11	18/6/44 ⁶		T/162		"H"	
12	24/6/44	63° 00' N 00° 50' W	P/162	U-1225	"A"	Canso shot down
13	30/6/44	63° 20' N 00° 10' E	A/162	U-478	Sighting	Unable to attack ⁷
14	30/6/44	63° 27' N 00° 50' W	A/162, E/86 ⁸	U-478	"A"	Depth charges did not drop. Canso damaged.
15	4/8/44 ⁹		F/162	U-300	"E"	
16	4/8/44 ¹⁰		K/162	U-300	"E"	
17	3/11/44 ¹¹	61° 50' N 18° 02' W	X/162	non-sub		
18	5/11/44 ¹²	60° 12' N 20° 40' W	X/162	non-sub	"miss astern"	

⁵ Sighting report only; Canso shot down, 1 survivor became POW. For details, see 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), 593.

⁶ Only one mention of this sighting or attack has been found, and it is almost certainly in error. The squadron records make no mention of any such event, and in any case T/162 had been lost to enemy action five days earlier.

⁷ Aircraft was unable to lose height in time to make an attack before U-boat submerged.

⁸ Credit for sinking shared with 86 (GR) Squadron, RAF.

⁹ Attack used Mk. 24 Mine. Attack was 65 miles from convoy UR 130 (Loch Ewe - Reykjavik).

¹⁰ Attack used Mk. 24 Mine. Both these attacks were assessed as "E" at the time, but only the first attack caused damage. Liberator L/59 (RAF) also attacked U-300 later the same day without causing damage, while Catalina A/333 made a sighting on the 15th.

¹¹ Attack used Mk. 24 Mine. Postwar reassessment noted that the nearest U-boat was U-396, which was 225 miles to the northeast of this position. Attack was probably carried out on a willywaw.

19	23/11/44 ¹³	62° 47' N 21° 58' W	X/162	U-300?	No attack
20	1/4/45 ¹⁴	63° 32' N 15° 38' W	M/162	non-sub?	Sighting
21	1/4/45 ¹⁵	63° 21' N 14° 19' W	O/162	non-sub	"G"
22	21/4/45 ¹⁶	62° 18' N 13° 16' W	R/162	non-sub	"G"
23	24/4/45 ¹⁷	60° 12' N 16° 47' W	M/162	non-sub	Sighting
24	26/4/45 ¹⁸	66° 26' N 17° 15' W	B/162	non-sub	Sighting

¹² Attack used 3 depth charges. Aircraft was presumably carrying Mk. 24 on remaining bomb carrier. Postwar reassessment noted that the nearest U-boat was U-396, which was 250 miles to the northeast of this position. Attack was probably carried out on a willywaw.

¹³ Moving wake was sighted approximately 10 miles distant, but had disappeared by time aircraft reached location. Postwar reassessment noted that although U-300, on its return trip from Reykjavik, was in the area, the sighting was probably a willywaw.

¹⁴ The "suspicious disturbance" on the water disappeared before the aiming point for an attack could be determined. The only reference found so far is in "Weekly Intelligence Report No. 2 - No. 162 Squadron, R.C.A.F. For week ending 23:59 hrs. Thursday, April 5th, 1945," DHist 181.003 (D58).

¹⁵ Attack used Mk. 24 Mine on sonobuoy contact after puffs of whitish smoke were seen coming from an object breaking the surface at frequent but irregular intervals. Postwar reassessment noted that no U-boat was within 110 miles. Attack was probably carried out on a school of whales or porpoises. The squadron intelligence report for this period of time attributes the attack to U/162, but O/162 is given credit in all other documents.

¹⁶ Initial sighting similar to above. Attack used two Mk. 24 Mines without result and sonobuoy gave no evidence of a submarine. Puffs were seen again about ten minutes later two miles away, and sonobuoys picked up a contact. R/162 was circling this site when Liberator L/53 spotted it and investigated. Sonobuoys were dropped and an attack was made by the Liberator with one Mk. 24 Mine. Postwar reassessment noted that no U-boat was within 120 miles of this position, and that the initial sighting and subsequent attacks were probably made on whales.

¹⁷ "H.Q. Coastal Command - Daily Summary of A/S Operations," in "A/S Ops. Intelligence Summary No. 155 -- Weekly Period Ending 2359Z 20th April 1945," NAC, RG 24, vol. 11027, file COAC 7-21-3, vol. 2, "A/S Warfare Summaries and Reviews - EAC Weekly" Postwar reassessment was that the sighting was probably of a nearly expended smoke marker.

¹⁸ *ibid.* Postwar reassessment was that the sighting was probably a whale, since no U-boat was within 110 miles of this position.

25 10/6/45¹⁹ 61° 56' N 10° 35' W A/162 U-1231²⁰ Sighting U-boat had surrendered

¹⁹ "Weekly Intelligence Report No. 7 - No. 162 Squadron, R.C.A.F. For week ending 23:59 hrs. Thursday, May 10th, 1945," DHist 181.003 (D58). This was the only U-boat to surrender to an aircraft from Iceland. 162(BR) ORB, Summary for May 1945.

²⁰ U-boat was almost certainly *U-1231*; the other possibility was *U-979*, but position and description of the sighting favour the former.

Appendix B

Cruising Range and Cruising Speed of RCAF Bomber Reconnaissance Aircraft

The term "cruising range" refers to the range under normal patrol conditions.

Cruising speed in the same way refers to an aircraft loaded with bombs, ammunition, etc.

The following figures refer to maximum range (and not an operational radius) at cruising speed.

Liberator (B-24)	3250 Nautical Miles at 150 knots
Catalina Flying Boat	2300 Nautical Miles at 100 knots
Canso A (Amphibian)	2000 Nautical Miles at 95 knots
Digby (B-18)	1800 Nautical Miles at 120 knots
Hudson Mark I, III (*)	1500 Nautical Miles at 135 knots
Ventura PB1 (*)	1600 Nautical Miles at 160 knots
Stranraer	1000 Nautical Miles at 85 knots

(*) - Figures are approximate

Actual safe range, or the Prudent Limit of Endurance, is considerably less than the above figures due to the margin of safety needed to enable aircraft to return to an alternative base if weather conditions necessitate it. Anything up to 600 mile range was held as reserve, depending on the type of aircraft. When allowance is also made for patrolling time once the aircraft reached the patrol area, it can be seen that other than Very Long Range (VLR) aircraft, a limited mid-war acquisition, all aircraft had difficulty in covering convoys many miles from land.

An example of this may illustrate the point. Suppose Convoy X is in the approximate position 52° N, 40° W. The distance from the nearest air base, in this instance Gander, is 600 miles. The return trip takes 1200 miles of the total range. An additional 500 miles is allowed for the safety factor, particularly in the case of Newfoundland based aircraft which often had to divert to Nova Scotia in the event of bad weather. The Canso A, until 1943 the only Canadian aircraft available for long range convoy escort on the East Coast, had a cruising range of 2000 miles. A total of 1700 miles has been consumed before protection can be given to a convoy at 52° N 40° W. The remaining 300 miles or approximately 3 1/2 hours can be devoted to actual coverage around the convoy.

It was more common in the winters of 1941-42 and 42-43 for U-boats to concentrate their operations at the extreme range of LR aircraft such as the Canso. For example, assuming the convoy to be at 55° N 38° W (780 miles from base) the same Canso aircraft would be able to merely contact the convoy and return to base and this only with a reduced safety margin. Fortunately, VLR aircraft reduced this problem to a minimum since distance was no longer a limiting factor. However, as long as the supply of these very long range aircraft was limited and long and medium range aircraft are used, it is well to keep in mind the limitations imposed upon air crews by the type of aircraft they fly.¹

¹ Based on RCN-RCAF Monthly Operational Review, August 1943, 10, NAC RG 24, vol. 11464, file "A/S Warfare - Aircraft".

Appendix C

The Mark 24 Mine and the AN/CRT-1 Sonobuoy: Some Technical and Operational Notes

The Mark 24 Mine

Prior to September 1941 Coastal Command's aircraft made 245 attacks on U-boats but recorded only three sinkings (all shared with surface ships), one U-boat surrendered to aircraft, and several that were damaged.¹ The depth charges which formed the main armament of anti-submarine aircraft, and other weapons such as rocket projectiles could only be used to attack surfaced U-boats, or those recently submerged. Once a submarine had disappeared from the surface, however, it was effectively out of the reach of attacking aircraft. Through 1941-42 aircraft achieved increasing success with air dropped depth charges, but all of this depended entirely on catching the sub on the surface or in the early stages of a dive. Once the sub was down and the swirl of its dive dissipated there was no way to track and attack it from the air. The situation remained the same until mid-1943, when a new anti-submarine weapon entered service with Allied maritime and naval air units. Aircraft were finally given a weapon that could attack submerged U-boats.

The Mark 24 Mine was an air-dropped passive acoustic homing torpedo. Relying solely on the noise created by its target, the weapon was designed to home in on and destroy submerged U-boats. Anticipating America's entry into the Second World War, the United States Navy's Bureau of Ordnance had commissioned studies of underwater sound propagation and improved methods of detection at Harvard in 1940. Inspired by these studies, scientists had proposed an acoustic homing torpedo.² Contracts for development work on such a weapon were let in early 1941 as a result of an investigation by the

¹ 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), 473-474.

² Montgomery C. Meigs, Slide Rules and Submarines: American Scientists and Subsurface Warfare in World War II, (Washington, DC: National Defense University Press, 1990), 32-33. Proposals for an acoustic homing torpedo had apparently been made during the 1930s but were rejected as impractical. Robert Gannon, Hellions of the Deep: The Development of American Torpedoes in World War II, (University Park, Pa: Pennsylvania State University Press, 1996), 102.

National Defense Research Committee (NDRC) of the United States Navy's antisubmarine effort. In December 1941 a formal proposal for development work was made by the Harvard Underwater Sound Laboratory (HUSL) to the NDRC, which issued a directive to HUSL and Bell Laboratories to proceed with development. Work on the device was carried out by scientists at Harvard in conjunction with engineers from Bell Laboratories, with costs in Fiscal Year 1942-1943 totaling over 13 million dollars.³ After extensive development work and field trials, production of the weapon began in early 1943, and its first successful combat use was on 12 May 1943 when a Liberator of 86 Squadron RAF damaged *U-456*, which was sunk by convoy escorts the following day. The first sinking using the weapon occurred two days later on 14 May when *U-640* was sunk by a PBY-5A of VP-84, USN.⁴ During the war, all Allied forces combined dropped 340 Mines in 264 attacks, sinking 37 submarines and seriously damaging 18, giving the weapon an effectiveness rate of 16%. Of these, American forces dropped 142, sinking 31 submarines and damaging 15, for an effectiveness rate of 32%. In comparison, the average effectiveness of depth charges throughout the war was 9.5%.⁵

The Mark 24 Mine was known by a several codenames. In fact, the term "Mark 24 Mine" was something of a misnomer, and it had apparently been bestowed either as a security measure or because much of the development work had been carried out by the USN's mine, not torpedo, section. The weapon was surrounded by extensive security because of its susceptibility to simple countermeasures, since some in the USN thought that

³ Meigs, Slide Rules and Submarines, 26, 57; Gannon, Hellions of the Deep, 105-107.

⁴ Meigs, Slide Rules and Submarines, 106, 123, 130-131; Alfred Price, Aircraft versus Submarine: The Evolution of the Anti-Submarine Aircraft, 1912 to 1980, (New York: Jane's, 1980), 137-138; Norman L.R. Franks, Search Find and Kill: Coastal Command's U-boat Successes, (Bourne End: Aston Publications, 1990), 131. It was originally believed that the attack on 14 May had sunk *U-657*, but it was sunk by HMS *Swale* on 17 May. Meigs incorrectly identifies the submarine sunk the the attack on the 14th as *U-657*, despite its correct identity being known since at least 1977.

⁵ Gannon, Hellions of the Deep, 199, 199 n.19. The figures probably do not accurately reflect the effectiveness of the Mine against submarines, since many of the late-war attacks made with the weapon were not made against submarines but against bogus schnorkel sightings. The effectiveness of aircraft depth charges varied throughout the war.

a countermeasure to the weapon could be developed within three weeks were the Germans to learn of its existence.⁶ Its initial codename was "Project 'Z'", which was changed on 25 April 1944 to "Proctor". For reasons of secrecy the weapon was referred to in after-action reports as a 600 lb. depth charge. Various unofficial nicknames were also affixed to the weapon, including "Fido" and "Oscar".⁷ The susceptibility to simple countermeasures that motivated these security precautions was caused by the weapon's homing system. The Mark 24 Mine was a passive homing weapon, whose guidance system homed in on the noise made by a submarine. The range at which the Mine would home in on a target depended on the speed and depth at which the U-boat was traveling, as well as on the roughness, temperature, and density of the water, and the sound reflecting characteristics of the ocean bottom in shallower water.⁸ Considerable uncertainty existed during the war

⁶ Norman Friedman, US Naval Weapons Systems: Every gun, missile, mine and torpedo used by the US Navy from 1883 to the present day, (London: Conway Maritime Press, 1983), 118; Gannon, Hellions of the Deep, 106-107, 199-200; "Tactical Employment of Mark 24 Mine," 4 August 1943, 1, DHist 181.009 (D4897), vol. 2. The experience of the RCAF Secret Devices crew sent to Reykjavik gives an example of the degree of security surrounding the weapon. The crew arrived in Reykjavik on 1 June, but the RAF officer who had requested their posting had himself been posted, and no correspondence about this crew could be found. As a result, nobody at the base knew what the crew's duties were, so they were not admitted to the SD shop. Not until 19 July were the crew admitted to the shop, and then they were only allowed to work on the less highly classified sonobuoy equipment. "Report of Trip to 162 Squadron, Reykjavik, Iceland," 30 August 1944, 1-2, DHist 181.002 (D481).

⁷ Coastal Command, "General Instructions for the Operation of the Mark 24 Mine," 29 June 1944, 4, PRO AIR 15/564; EAC, "Command Instructions for the Use of Proctor," 20 June 1944, 4, DHist 181.009 (D3494); AFHQ to HQ EAC, signal A.1277, 25 April 1944, NAC RG 24, vol. 6173, file HQ.19-6-30, vol. 3, "Proctor - EAC"; Samuel Eliot Morison, History of United States Naval Operations in World War II, Volume X: The Atlantic Battle Won, May 1943-May 1945, (Boston: Little, Brown, 1968), 52; 162 (BR) ORB, 15 March 1944. It is interesting to note that German intelligence reports referring to anti-submarine homing torpedoes called the device "Oscar". Since this was a nickname used in Iceland, at least by 162 (BR), this suggests that security leaks or German agents' activities may have taken place in Reykjavik. Further research in this area might obtain interesting results. Günter Hessler, The U-Boat War in the Atlantic, Volume III: June 1943-May 1945, (London: HMSO, 1989), 53. Hessler's discussion of Allied anti-submarine weapons in *ibid.*, 51-53, is based on "Submarine Situation 1.6.1944," BdU war diary, IX, 351-359, DHist 79/446, and "State of enemy submarine defence May 1944," BdU war diary, IX, 363-368. The latter report concluded that although the Allies had information about German homing torpedoes and were working in the field, they apparently had no such weapons for their own use. *ibid.*, 368.

⁸ Coastal Command, "General Instructions for the Operation of the Mark 24 Mine," 2, 29 June 1944, PRO AIR 15/564.

about the actual ranges at which a Mine could home in on a U-boat, but the figures given in Table 2 provide some idea of the weapon's capability as estimated by British and American experts.

The Mark 24 Mine had an overall length of eighty-four inches, a diameter of nineteen inches, and a weight in air of 680 pounds. It had four major components: the warhead, the main body, the after-body, and the propeller unit. The warhead held 100 pounds of TNT or Torpex explosive and a contact fuze. The main body had four hydrophones spaced around its circumference and the circuitry that translated the sounds picked up by the hydrophones into control impulses for the two steering motors, one operating in the vertical plane and one in the horizontal plane. Also contained in the main body was the lead-acid storage battery, which provided power for the main motor and the electronics. The energy that the battery could deliver was limited by its temperature, so an internal heating circuit was fitted for use in cold conditions, operated by the battery itself.⁹ The Mine was driven through the water at twelve knots for twelve to fifteen minutes, giving a range of approximately three nautical miles. At the end of its run, the slight negative buoyancy of the weapon caused it to sink to the bottom and avoid the possibility of its being captured by the enemy.¹⁰

The Mark 24 Mine was carried either under the wing or in the weapons bay of aircraft. When dropped against a submarine, constraints on aircraft altitude and speed were imposed to ensure the weapon would function correctly after entering the water. As it was

⁹ Coastal Command, "General Instructions for the Operation of the Mark 24 Mine," 2, 29 June 1944, PRO AIR 15/564; "Tactical Procedure - Mark 24 Mine," 10 April 1943, PRO AIR 15/450. The internal heater was used when the mine would encounter temperatures below 50° Fahrenheit, and was capable of operating during an entire flight. After ten hours of operation, however, the battery's capacity would be reduced by 25%, which would give the weapon a running time of nine minutes. If the heater did not work and the battery reached a temperature of 0° F, a running time of about three minutes would be the result. *ibid.*

¹⁰"Mark 24 Mine, Part I - General Characteristics," n.d., PRO AIR 15/450. This source is part of some Coastal Command technical instructions for the weapon, the remainder of which were destroyed, presumably since newer instructions had been issued. Message on *ibid.*, 11 March 1944.

released from its carrier, two arming wires removed safety devices from the weapon and prepared it for arming. The first wire released the arming diaphragm and cleared the water ingress holes in the fuze cap, while the second applied double voltage to the heaters in the electronic tubes in the mine in order to warm them up, partially armed the relay that switched on current to the main motor, and changed various connections in the mine from their "test" settings to their "operate" settings. On its way from the aircraft to the water, a plywood nose spoiler ring and tail stabilizer acted as spoilers to slow the weapon, reduce in-air oscillations, and ensure a satisfactory trajectory and entrance angle. As the Mine hit the water these fairings broke off, and their coat of yellow paint marked the point of impact. The Mine continued to descend, and at fifteen feet an arming bellows reduced the voltage to the tube heaters and supplied electricity to the tube circuits. The propulsion motor was also started and continued to operate from this point onwards until the battery was exhausted. Three seconds later, after reaching a depth of twenty-five feet, the warhead fuze was fully armed.¹¹

After the weapon's downward path took it past its preset cruising depth, which was initially forty-five feet but was later increased to one hundred and twenty-five, the hydrostatic depth control brought it back to this depth. A pendulum stabilizer was used in conjunction with the hydrostatic mechanism to maintain a stable depth. At this point the Mine began to run in a circle about 150 feet in diameter, searching for its target. Due to the nature of its control system, it had a corkscrew forward motion.¹² In order to avoid

¹¹ "Mark 24 Mine, Part I - General Characteristics, Part II - Acoustic Control System, Part III - Operation of Mine from Release from Plane to Point of Complete Acoustical Control," n.d., PRO AIR 15/450; "Command Instructions for the Use of Proctor, A - Information," 20 June 1944, DHist 181.009 (D3494); Gannon, Hellions of the Deep, 123-124, 178-179.

¹² "600 Lb. D.C. Characteristics and Tactics," 21 April 1945, DHist 181.002 (D481); Gannon, Hellions of the Deep, 120; Memorandum, DofS/ST.6 to D/Ops, "Status of Proctor & Related Equipment in U.S.A.," 20 February 1945, 2-3, DHist 181.009 (D4897); "; "Notes on Meeting in Room 3075, Lisgar Building, Oct. 26/43, Subject:- Anti-Submarine Warfare," 26 October 1943, NAC RG 24, vol. 11463, file "A/S Warfare - Aircraft". The Mine used proportional control instead of a "bang-bang" system. The latter threw the rudders either full over or not at all. Proportional control affected the rudders to varying degrees and its method of operation probably accounted for the corkscrew motion of the weapon.

damage to Allied surface ships, a minimum depth of thirty feet was maintained by a hydrostatic “ceiling” switch, which disabled the acoustic homing system and returned control of the weapon to the depth control circuit until the weapon exceeded a depth of thirty feet, after which control would be returned to the hydrophones if the acoustic signal were still strong enough. Once the Mine’s hydrophones had picked up an acoustic signal above a given value, relays operated to disable the depthkeeping and other controls. The weapon was under complete acoustic control, and began to home in on its target, relying on a contact fuze for detonation. If the Mine did not home in on a target or lost contact it either remained at or returned to its cruising depth, until the battery was exhausted, usually after fifteen minutes’ operation, when the negative buoyancy of the weapon caused it to sink.¹³

The Mine was at its most effective when the target submarine was crash diving or proceeding at full speed near the surface, and at the time of its entry into service, U-boat doctrine unwittingly contributed to the weapon’s success. A U-boat operating on the surface would dive quickly to escape air attack, with its electric motors operating at full speed and its propellers generating large amounts of noise, generally through cavitation. As a result of these characteristics, operational doctrine called for the Mine to be used within ninety seconds of a U-boat’s submergence.¹⁴ Following the introduction of the

¹³ “Mark 24 Mine, Part I - General Characteristics, Part II - Acoustic Control System, Part III - Operation of Mine from Release from Plane to Point of Complete Acoustical Control,” n.d., PRO AIR 15/450; Gannon, Hellions of the Deep, 120. Despite efforts to prevent damage to friendly vessels using the cutout mechanism described above, the Royal Navy escort carrier *Biter* was damaged on 16 November, 1943, when one of her Swordfish carrying a homing torpedo made a crash landing in the sea just astern of the ship. The shock of the crash released the torpedo, which homed in on the carrier. The torpedo detonated on the ship’s rudder, demolishing its bottom after corner and damaging the structure of the rudder to the extent that the steering was slightly affected. Hull plating below the waterline at the stern suffered minor damage. This put the ship out of action for a month after she had returned to the UK. Kenneth Poolman, Escort Carrier, 1941-1945: An Account of British Escort Carriers in Trade Protection (London: Ian Allan, 1972), 106-107.

¹⁴ Coastal Command, “Tactical Procedure - Mark 24 Mine,” 10 April 1943, 2-3, PRO AIR 15/450; “Command Instructions for the Use of Proctor,” 20 June 1944, DHist 181.009 (D3494). Cavitation is the production and collapse of partial vacuum cavities in the water. It reduces the effectiveness of propellers, and also generates tremendous amounts of noise. Gannon, Hellions of the Deep, 118-120.

schnorkel, however, surfaced submarines were seen far less frequently, if at all, but the Mine remained a useful weapon. By January 1945, Coastal Command had decided that since it offered such good chances against schnorkelling and recently completely submerged U-boats, the Mark 24 Mine used in conjunction with the sonobuoy should become the primary weapon used to attack such targets, as well as the smoke puffs and wakes that many aircraft were sighting. This opinion was soon reflected in Coastal Command tactical doctrine, which was changed to state that "The Mark 24 Mine is to be regarded as the primary means of attack against schnorkels or against wakes, swirls, or smoke puffs emanating from schnorkelling U-Boats."¹⁵

As mentioned above, heavy security surrounded the Mark 24 Mine. "This weapon," a list of RCAF security regulations began, "is in the MOST SECRET category, and is one of the most secret weapons in use by the allied powers today."¹⁶ Postwar, the RCAF continued to regard Proctor as Top Secret, and even in the 1960s researchers at the RCAF Historical Branch in Ottawa were unaware of the full details of the weapon. An unsubstantiated rumour also exists that aircrew received orders that if a U-boat were sunk with the weapon any survivors were to be machine-gunned in the water in order to maintain secrecy.¹⁷ Another interesting aspect of the security surrounding the Mark 24 Mine was

¹⁵ Great Britain, Air Ministry, Air Historical Branch, "The RAF in Maritime War, Volume V: The Atlantic and Home Waters - The Victorious Phase, June 1944 to May 1945," 200-201; Coastal Command, "General Instructions for the Operational Use of the Mark 24 Mine," 27 February 1945, DHist 181.009 (D4897), vol. 2.

¹⁶ "Security Regulations for Project 'Z,'" DHist 181.002 (D480). For more complete information on security measures, see Eastern Air Command, "Command Instructions for the Use of Proctor, D - Security Measures for Proctor," 20 June 1944, DHist 181.009 (D3494).

¹⁷ CAS to AOC, RCAF Maintenance Command, "Type Z Aircraft Identification Equipment - Lancaster X Aircraft," 20 June 1946, NAC RG 24, vol. 6174, file HQ.19-6-30, vol. 6, "Proctor - EAC"; F/O H.A. Halliday to A/M C.L. Annis, "History - Eastern Air Command," 24 August 1964, DHist Biographical File, "Annis, Clare Levi"; Carl Vincent, Canada's Wings, vol. 2: Consolidated Liberator And Boeing Fortress, (Stittsville, Ont.: Canada's Wings, 1975), 184. The "shoot survivors" story may have originated with a single person who had served with 10 (BR). The "Type Z Aircraft Identification Equipment" referred to in the first letter was an infrared signalling device for use by bombers, which Maintenance Command had confused with Project "Z" when requesting equipment for a demonstration at the Air Armament School at Mountain View, Ontario. See Memorandum, AOC RCAF Maintenance Command to AFHQ, "'Z' Project - Supply," 8 June 1946, NAC RG 24, vol. 6174, file HQ.19-6-30, vol. 6, "Proctor - EAC".

that the aircrew using it were not always briefed on its principles of operation. Following its introduction to Canadian service, Eastern Air Command security instructions prohibited the briefing of crews on the mechanical details and basic principles of the weapon, and furthermore the aircrew had been intentionally misled on its principles of operation. By October 1943 these restrictions were beginning to cause difficulties and confusion. The RCAF delegation in Washington, which handled much liaison work, was

astounded and baffled how pilots could employ [the] weapon at maximum efficiency without knowledge of [its] method of operation . . . giving them misleading data is beyond our perception. EAC instructions re Project Z gave no indication that such conditions existed or otherwise would have commented before. Do not understand here why knowledge [of] this project [is] limited to so few that it has affected employment of weapon also equipment administration.¹⁸

Such a decision on the part of EAC was unusual; the United States Navy briefed all of its aircraft captains and second pilots on the Mine's principles of operation, although some sources imply that American aircrews did not receive such briefings.¹⁹ The legitimate wartime secrecy surrounding the Mark 24 Mine that persisted after the end of the war has undoubtedly contributed to these misconceptions and rumours. While the development of the weapon has recently been chronicled, an historical study of the weapon's operational history, especially the development of tactical doctrines for its use, is needed and such a study would be a worthwhile undertaking.²⁰

¹⁸ AFHQ to AFCS Washington, signal A.2288, 18 October 1943, AFCS Washington to AFHQ, signal A.383, 19 October 1943, NAC RG 24, vol.6173, file HQ.19-6-30, vol. 2, "Proctor - EAC".

¹⁹ AFHQ to AFCS Washington, signal A.2288, 18 October 1943, NAC RG 24, vol.6173, file HQ.19-6-30, vol. 2, "Proctor - EAC"; Gannon, Hellions of the Deep, 200; M.D. Fagen, ed., A History of Engineering and Science in the Bell System, vol. 2, (Bell Telephone Laboratories, 1978), 195-196. Prior to October 1943, the USN might not have briefed its pilots on the operation of the weapon, but the very limited information available seems to suggest that this was not the case.

²⁰ Gannon, Hellions of the Deep. The differences between American, British, and Canadian forces in tactical doctrine for use of the Mine, and their responses to the use of the schnorkel by U-boats, would be worth studying.

The AN/CRT-1 Sonobuoy

Developed at much the same time as the Mark 24 Mine, the sonobuoy was an air launched sensor that allowed aircraft to track submerged contacts. The idea of the sonobuoy was first suggested in May 1941 by Dr. P.M.S. Blackett, a British scientist, as a means for convoys to detect submarines that might be trailing them. These buoys were to be released by escort vessels and would pick up noises made by U-boats trailing the convoys and radio these noises to the convoy. Since the British did not have the resources to develop the idea, it was brought to the attention of the American government, and RCA developed a model of the surface launched buoy which did not see service. The idea was later revived, but this time for use by aircraft. An experimental installation in the United States Navy blimp *K-5* detected a test submarine at a range of up to three nautical miles in early March 1942, but the USN displayed little interest in sonobuoys. The United States Army Air Forces, however, were interested. By mid-July 1942 test drops of sonobuoys were being made from USAAF B-18s. After some initial failures, the buoys operated successfully, and they entered service in August.²¹

The AN/CRT-1 sonobuoy contained a short-range ultra high frequency (UHF) radio transmitter which transmitted the sounds picked up by a hydrophone suspended twenty feet below the surface of the water. Aircraft or surface vessels equipped with the appropriate receiver (AN/ARR-3) could pick up these transmissions and an operator could listen to the sounds and attempt to analyze them. The buoys were non-directional but operated on six different frequencies, which allowed the signals from a pattern of buoys to be compared, which could give some indication of the submarine's location and course. However, such indications were uncertain at best. Furthermore, even moderate seas created enough noise to overwhelm the sounds being made by the submarine and thus make the sonobuoys useless. The sonobuoys had an effective range of one to two miles

²¹ Friedman, US Naval Weapons, 106.

against submarines, with a maximum range of four to five miles on occasion. The buoys could determine whether the submarine's propellers were in use and would also allow an operator to make an estimate of the submarine's speed by counting the revolutions made by the propellers. The sonobuoy made it possible to localize a submerged U-boat enough for an aircraft to drop a Mark 24 Mine. The impact of a Mark 24 Mine hitting the water, and the detonation of the weapon could also be heard,²² and the use of any decoys or unusual tactics by the submarine could be detected. In case the attack were to fail, contact could be maintained with the submarine, and other anti-submarine forces could be called in to make further attacks.²³

The sonobuoys weighed fifteen pounds each, and were about four feet long and just over four inches in diameter. Usually launched through a hatch, the buoys were probably launched from the aft blisters on Cansos. The thirty-nine inch aerial had to be pulled out before launching, and the wooden plug covering a soluble wax seal was loosened. A static cord which deployed the sonobuoy's parachute was then attached to the aircraft, and if time allowed, a test of the buoy would be carried out. When the order to launch was given, the marine marker used to indicate the sonobuoy's position was thrown out, followed by the sonobuoy. After it was launched, the static line opened the parachute

²² In late 1944 the USN discovered that when the Mark 24 Mine's battery was depleted and it began to sink, detonations would often occur when the Mine reached a depth of 560 feet. The battery compartment would collapse at this depth and result in detonation of the warhead. They concluded that "this [probably] explains most of the detonations recorded as having occurred more than 7 minutes after the drop and which were not believed to have resulted in kills or damage." Memorandum, DofS/ST.6 to D/Ops, "Status of Proctor & Related Equipment in U.S.A.," 20 February 1945, 4, DHist 181.009 (D4897).

²³ "Technical Appendix to Report of F/O C.I Soucy's Visit, June 13 to June 17 to U.S. Navy, Washington, D.C.," 22 June 1943, 4-5, NAC RG 24, vol. 6173, file HQ.19-6-30, vol. 1, "Proctor - EAC"; Douglas, The Creation of a National Air Force, 560-561. A task force consisting of three destroyer escorts and one escort carrier was picked up at a range of fifty miles by sonobuoy, but this was obviously an unusual incident. Exercises by 162 (BR) Cansos picked up what appeared to be a freighter at a range of five to six miles and gunfire and the explosion of practice bombs from an aircraft carrying out bombing and gunnery practice some ten to twelve miles away. DofS/ST.6 TO D/Ops, "Status of Proctor & Related Equipment in U.S.A.," 20 February 1945, 4, DHist 181.009 (D4897), vol. 1; "Report of Trip to 162 Squadron, Reykjavik, Iceland, Section B - Radio Sonic Buoys," 30 August 1944, "Tracking Experiment - S.B. Investigation, Reykjavik Iceland," 17 August 1944, DHist 181.002 (D481).

that lowered the buoy to the water. Impact with the water released the hydrophone, which sank to a depth of twenty feet. As with the Mark 24 Mine, detection ranges varied with the speed and depth of the target, as well as the water conditions (see Table 5). The batteries had an operating life of five or six hours, and the transmitter an average range of five to ten miles. After about ten hours, the dissolution of a water soluble wax seal caused the buoy to sink in order to avoid capture by the enemy. If the plug did not dissolve, the case itself was made of cardboard and would only last some fifteen hours once dropped in the ocean.²⁴

Further wartime developments of the sonobuoy included the AN/CRT-1A, which differed little from the AN/CRT-1, mainly in that its components were shock mounted and its hydrophone was lowered to a depth of twenty-four instead of twenty feet. It was also slightly lighter than the earlier version. The newer model entered service with the USN in 1944 while the earlier one remained in service with the RCAF until at least early 1944 if not later. Despite some problems with its parachute, almost 60,000 units were bought by the USN through the end of 1944. A directional model, the AN/CRT-4 sonobuoy, began development in 1944. Easier to deploy than earlier versions, the directional buoy gave an aircraft laying a pattern of sonobuoys a much better chance of fixing the location of a submerged U-boat. In order to give this directional capability the hydrophone was rotated at five revolutions per minute by a gravity motor powered by the bottom half of the hydrophone casing, which descended on the end of a line and provided the necessary energy. The motor would rotate the hydrophone for six hours, and a magnetic compass included in the sonobuoy indicated the direction that the hydrophone was facing once per rotation. In order to properly indicate and interpret the signals delivered by the sonobuoy,

²⁴ "Technical Appendix to Report of F/O C.I Soucy's Visit, June 13 to June 17 to U.S. Navy, Washington, D.C.," 22 June 1943, 4-6; AMAE:DRE/S to D/AMAS-Ops, "Expendable Radio-Sonic Buoys - Directional and Non-Directional," 10 April 1944, 3, DHist 181.002 (D480); "Coastal Command Training Instruction No. 28 - The Use of Sono Buoy Equipment," 9 June 1944, 2-3, DHist 181.009 (D4594). The USAAF had designed a drop chute for use on its B-18 aircraft which pulled out the antenna and parachute at the moment of dropping.

the receiver had to be modified so that bearings would be accurately processed. The bearings delivered by the sonobuoy were accurate within approximately ten degrees in a calm sea and twenty-five in a rough sea. Although the AN/CRT-4 was operationally evaluated in 1945, the United States Navy did not adopt it.²⁵ Despite their limitations, the earlier versions of the sonobuoy proved useful during the Second World War, and were the first examples of what is nowadays an essential sensor in anti-submarine warfare. Once again, as with the Mark 24 Mine, the history of the sonobuoy during the Second World War is largely unknown, and has not even had the benefit of research into its development as the Mine has had. Further research on the Mine would require work on the sonobuoy as well, since the two were often used together. This was reflected in the doctrines that were developed and that should be a central part of any further study of their history and tactical employment.

²⁵ "Expendable Radio-Sonic Buoys - Directional and Non-Directional," 10 April 1944, 2-4, DHist 181.002 (D480); Memorandum, Boyle to SASO, "Report - U.S.A. Visit by F/L T.P. Boyle," 5 August 1944, DHist 181.009 (D3494); "Memorandum on Visit of G.H. Henderson, O.R.S.O., to Washington," 25 January 1944, NAC RG 24, vol. 11463, file "Directorate of Operational Research (R.C.N.) Reports"; Friedman, US Naval Weapons, 266. Problems with parachute failure on the AN/CRT-1A were encountered at release speeds of over 120 knots.

Table 1: Mark 24 Mine Specifications²⁶

Length:	84 inches
Diameter:	19 inches
Charge:	100 pounds TNT or Torpex
Speed:	12 knots
Endurance:	15 minutes
Weight in air:	680 pounds
Weight in water:	20 pounds

Components:

- (1) A warhead fitted with a C.2 fuze mechanism and exploder system
- (2) The main body which contains the homing mechanism and the main storage batteries
- (3) The after-body which contains the main motor and two steering motors
- (4) The propeller unit

Table 2: Estimated Homing Range of Mark 24 Mine²⁷

<u>Submarine Depth</u>	<u>Submarine Speed</u>	<u>Homing Range (yards)</u>
60'	3 knots	25 - 110
	4 knots	120 - 250
	5 knots	300 - 800
	6 knots	600 - 1500
150'	3 knots	0 - 70
	4 knots	25? - 95
	5 knots	75? - 135
	6 knots	180 - 290
250'	3 knots	0 - 67
	4 knots	0 - 73
	5 knots	25? - 90
	6 knots	50? - 130

²⁶ Coastal Command, "General Instructions for the Operation of the Mark 24 Mine," 29 June 1944, PRO AIR 15/564.

²⁷ Low figures are estimates from the Admiralty's Department of Scientific Research, based on data from HMS *Graph*, the former *U-570*. High figures are from USN tests on an unspecified submarine. "Precis of Recent Conference & Minutes in Connection with the Mk 24 Mine," 4 September 1944, 4, PRO AIR 15/564.

Table 3: AN/CRT-1 Transmitter (Sonobuoy)²⁸

Weight	15 lbs.
Dimensions	4 3/8 in. diameter x 48 in. long.
Frequency	One of six fixed frequencies can be selected at approximate frequency of 70 megacycles.
Power Source	Dry batteries with 5 or 6 hours operating life
Floating life	Water soluble plug causes submergence within about 10 hours time. Cardboard case of buoy lasts about 15 hours.
Sonic Pickup Range	1 to 2.5 miles. Submarines travelling at 6 knots have been picked up at 4 to 5 miles.
Radio range	10 miles working average, 17 miles maximum.
Hydrophone depth	Suspended 20 ft. below buoy after impact release at water.

Table 4: AN/ARR3 Receiving Equipment²⁹

Units	Receiver Dynamotor Antenna AT-3/ARR3
Weight	Receiver 20 lb. Dynamotor 12 lb.
Dimensions	Receiver: 14 5/8 in. x 9 1/2 in. high x 10 1/4 in. deep plus 5 in. allowance for plugs. Dynamotor: 8 1/16 in. x 8 3/32 in. high x 4 11/16 in. deep plus 5 in. allowance for plugs.
Controls	Sensitivity and automatic frequency control switch. Frequency selector switch corresponding to six fixed frequencies usable by transmitters.

Table 5: Sonobuoy Detection Ranges³⁰

<u>Submarine Speed</u>	<u>Submarine Depth</u>	<u>Range</u>
2 knots	Periscope Depth to 250 feet	200 yards
4 knots	Periscope Depth to 250 feet	1,500 yards
6 knots	Periscope Depth to 250 feet	3,000 yards

²⁸ "Technical Appendix to Report of F/O C.I. Soucy's Visit, June 13 to June 17 to U.S. Navy, Washington, D.C.," 22 June 1943, 5, NAC RG 24, vol. 6173, file HQ.19-6-30, vol. 1, "Proctor - EAC".

²⁹ *ibid.*

³⁰ "The Mark 24 Mine and Sono-Buoy," 20 May 1944, 1, PRO AIR 15/564. These ranges are presumably for the AN/CRT-1 sonobuoy.

Appendix D

Flying Hours in the Northern Transit Area, January-May 1944

		Effective Hours	Total Hours	A/C Losses	Sightings	Attacks	Results Sunk	Dam	No. of U-boats in patrolled area
Jan	Day	44	109	-	-	-	-	-	10
	Night	64(N)	180(N)	-	-	-	-	-	
Feb	Day	158	241	-	-	-	-	-	5
	Night	80(N)	128(N)	-	-	-	-	-	
Mar	Day	370	594	-	-	-	-	-	11
	Night	59(N)	148(N)	-	-	-	-	-	
		27(L/L)	42(L/L)	-	-	-	-	-	
Apr	Day	372	586	1	-	-	-	-	14
	Night		84(N)	175(N)	-	-	-	-	
May	Day	2,458	3,874	1	19	13	6	3	29
	Night	160(N)	275(N)	-	2(N)	1(N)	-	1(N)	
		14(L/L)	24(L/L)	-	-	-	-	-	

Note: (N) designates night patrols, (L/L) designates night patrols using Leigh Light equipped aircraft.

Source: Great Britain, Air Ministry, Air Historical Branch, "The RAF in Maritime War, Volume IV: The Atlantic and Home Waters - The Offensive Phase, February 1943 to May 1944," 483 n. 2, DHist 79/599.

Appendix E

Flying Hours in the Northern Transit Area, June-August 1944

		Effective Hours	Total Hours	A/C Losses	U-boat Sights	U-boat Attacks	Results Sunk	Results Dam	No. that got through
	Day	3,264	5,690	6	24	18	8	4	
<u>June</u>	Night	1(N)	3(N)	-	-	-	-	-	15
		1(L/L)	1(L/L)	-	-	-	-	-	
	Day	2,490	5,708	4	27	22	4	10	
<u>July</u>	Night	48(N)	185(N)	-	2(N)	1(N)	-	-	1
	Day	2,605	4,373	1	8	6	-	1	
<u>Aug.</u>	Night	551(N)	1,064(N)	-	1(N)	0(N)	-	-	8
		181(L/L)	226(L/L)	-	-	-	-	-	

Note: (N) refers to night patrols, (L/L) refers to night patrols with Leigh Light equipped aircraft.

Source: Great Britain, Air Ministry, Air Historical Branch, "The RAF in Maritime War, Volume V: The Atlantic and Home Waters - The Victorious Phase, June 1944 to May 1945," 19, n. 1; 59, n. 3, DHist 79/599.

Appendix F

Flying Hours in the Reykjavik Area (All Squadrons), August-December 1944

	Task	Effective Hours	Total Hours	A/C Losses	U-boat Sights	U-boat Attacks	Results Sunk	Results Dam
<u>Aug.</u>		143	158	-	-	-	-	-
		17(N)	23(N)	-	-	-	-	-
<u>Sept.</u>		106	120	-	-	-	-	-
		19(N)	25(N)	-	-	-	-	-
	Patrol	41(L/L)	46(L/L)	-	-	-	-	-
	Convoy Escort	74	96	-	-	-	-	-
		8(N) 4(L/L)	12(N) 6(L/L)	- -	- -	- -	- -	- -
<u>Oct.</u>	Convoy Escort	7	9	-	-	-	-	-
		1(N) 6(L/L)	3(N) 7(L/L)	- -	- -	- -	- -	- -
		296	345	-	-	-	-	-
<u>Nov.</u>	Patrol	22(N) 346(L/L)	50(N) 385(L/L)	- 1(L/L)	-	-	-	-
	Convoy Escort	84	111	-	-	-	-	-
		2(N) 71(L/L)	18(N) 80(L/L)	- -	- -	- -	- -	- -
		192	219	-	-	-	-	-
<u>Dec.</u>	Patrol	12(N) 151(L/L)	25(N) 170(L/L)	-	-	-	-	-
	Convoy Escort	37	52	-	-	-	-	-
		2(N) 80(L/L)	8(N) 93(L/L)	- -	- -	- -	- -	- -
<u>Total:</u>		1721	2061	1(L/L)	-	-	-	-

Note: (N) refers to night patrols, (L/L) refers to night patrols with Leigh Light equipped aircraft.

August flying hours are for 26 to 31 August only. Division between patrol and convoy escort flying not given.

Patrol flying hours for October were not available.

Source: Air Ministry, "The RAF in Maritime War," V, 62, n.3, 87, n.2, 93, n.2, 106, n.1.

Appendix G

Flying Hours in the Reykjavik Area (All Squadrons), January-May 1945

	Task	Effective Hours	Total Hours	A/C Losses	U-boat Sights	U-boat Attacks	Results Sunk	Results Dam
	Patrol	3(L/L)	4(L/L)	-	-	-	-	-
<u>Jan.</u>	Convoy Escort	19 - 40(L/L)	28 1(N) 56(L/L)	- - -	- - -	- - -	- - -	- - -
	Patrol	2(L/L)	3(L/L)	-	-	-	-	-
<u>Feb.</u>	Convoy Escort	59 11(N) 8(L/L)	71 19(N) 10(L/L)	- - -	- - -	- - -	- - -	- - -
	Patrol	449 14(N) 120(L/L)	504 41(N) 135(L/L)	- - -	- - 1(L/L)	- - 1(L/L)	- - -	- - -
<u>Mar.</u>	Convoy Escort	116 4(N) 91(L/L)	158 23(N) 98(L/L)	- - -	- - -	- - -	- - -	- - -
	Patrol	36	41	-	-	-	-	-
<u>Apr.</u>	Convoy Escort	141 1(N)	178 13(N)	- -	- -	- -	- -	- -
	Patrol	111 6(N) 2(L/L)	119 9(N) 4(L/L)	- - -	- - -	- - -	- - -	- - -
<u>May.</u>	Convoy Escort	19 8(N)	23 14(N)	- -	- -	- -	- -	- -
<u>Totals:</u>		1260	1552	-	1(L/L)	1(L/L)	-	-

Note: (N) refers to night patrols, (L/L) refers to night patrols with Leigh Light equipped aircraft.

Source: Air Ministry, "The RAF in Maritime War," V, app. XVIII.

Appendix H

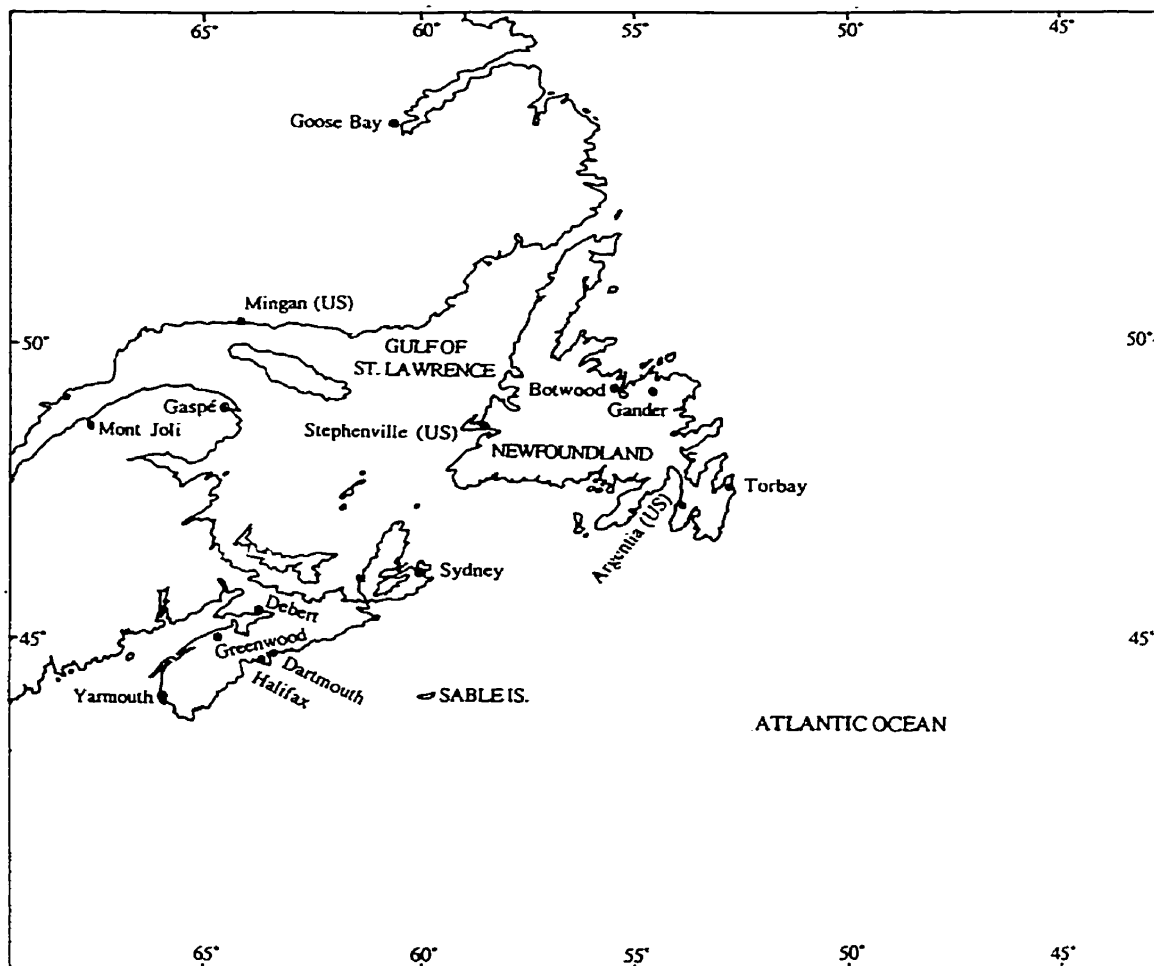
Flying Hours in the Western Half of the Northern Transit Area, January-May 1945

	Period	Effective Hours	Total Hours	A/C Losses	U-boat Sights	Attacks	Results Sunk	Damaged
	Day	280	435	-	-	-	-	-
<u>Jan.</u>	Night	10(N) 168(L/L)	198(N) 242(L/L)	- -	- -	- -	- -	- -
	Day	334	553	-	-	-	-	-
<u>Feb.</u>	Night	2(N) 115(L/L)	125(N) 183(L/L)	- -	- 1(L/L)	- 0(L/L)	- -	- -
	Day	322	578	-	-	-	-	-
<u>Mar.</u>	Night	4(N) 127(L/L)	81(N) 215(L/L)	- -	- -	- -	- -	- -
	Day	1170	2162	3	-	-	-	-
<u>Apr.</u>	Night	6(N) 63(L/L)	101(N) 310(L/L)	- -	- -	- -	- -	- -
	Day	193	302	-	-	-	-	-
<u>May.</u>	Night	3(N) 2(L/L)	20(N) 26(L/L)	- -	- -	- -	- -	- -
<u>Totals:</u>		2799	5531	3	1(L/L)	0(L/L)	-	-

Note: (N) refers to night patrols, (L/L) refers to night patrols with Leigh Light equipped aircraft.

January patrols carried out by Iceland aircraft only; others carried out by Iceland and 18 Group aircraft.

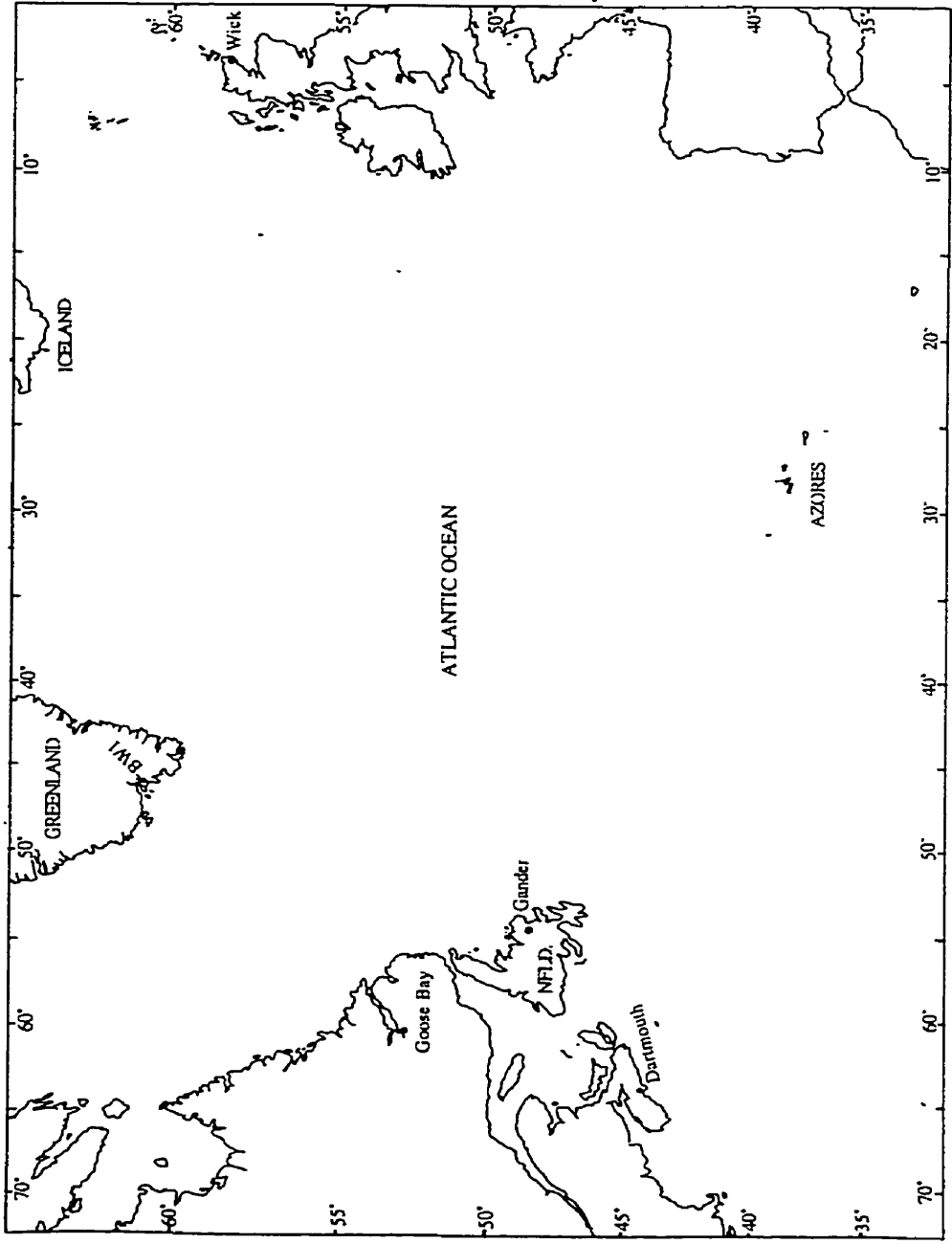
Source: Air Ministry, "The RAF in Maritime War," V, app. XVIII.



Map 1

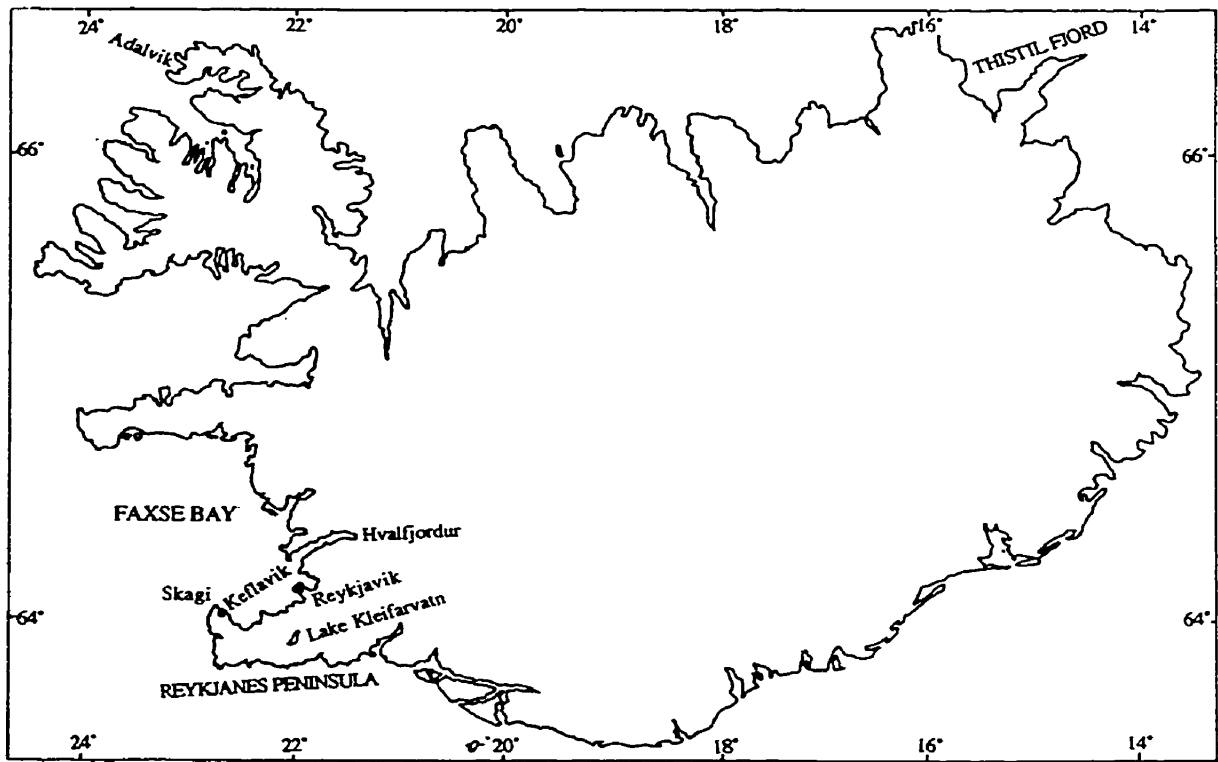
Eastern Air Command Bases in Canada and Newfoundland

SOURCE: "Eastern Air Command Harbour Entrance Patrols," DHist 181.005 (D2077); 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), 374.



Map 2

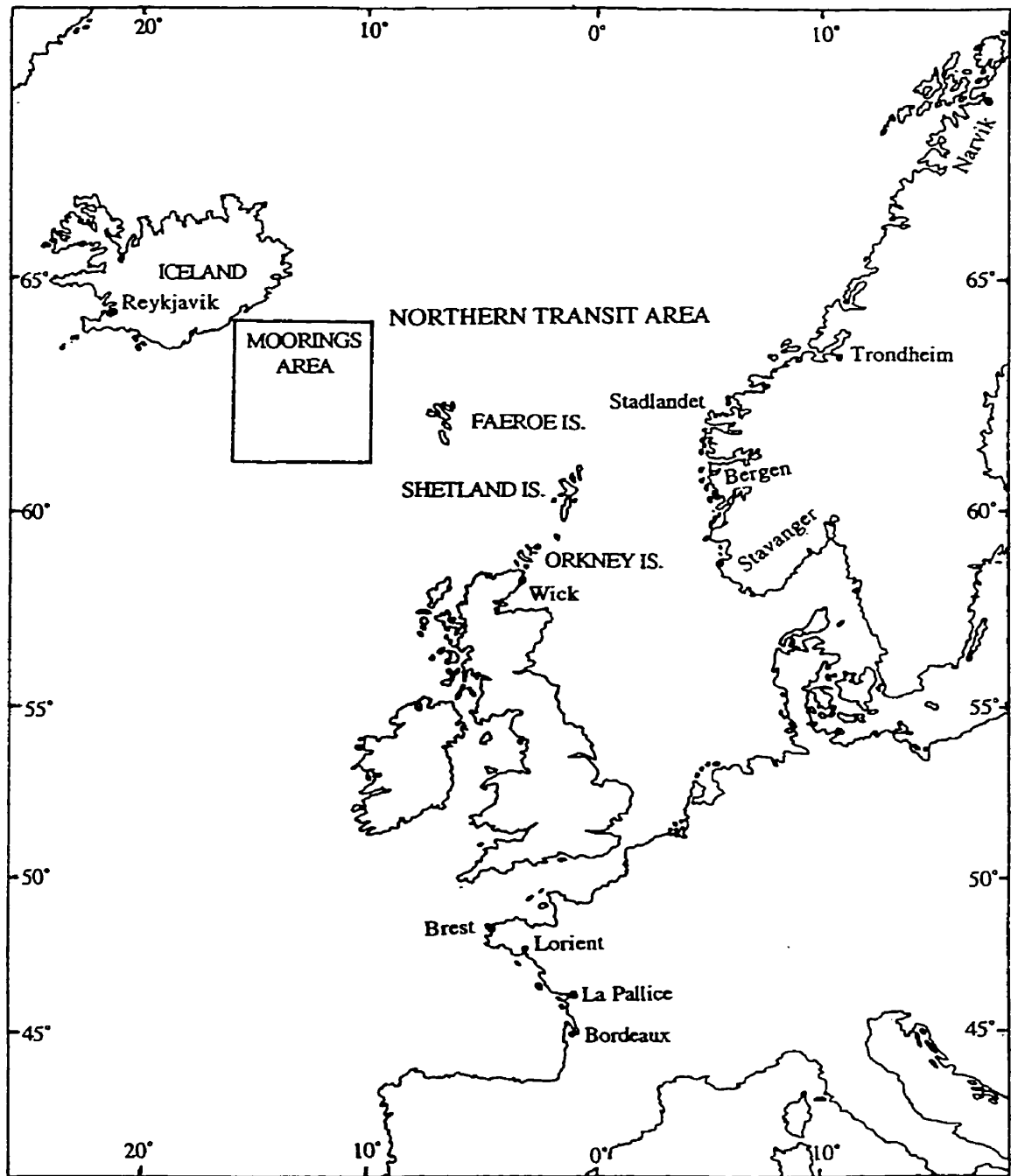
The North Atlantic Ocean



Map 3

Iceland

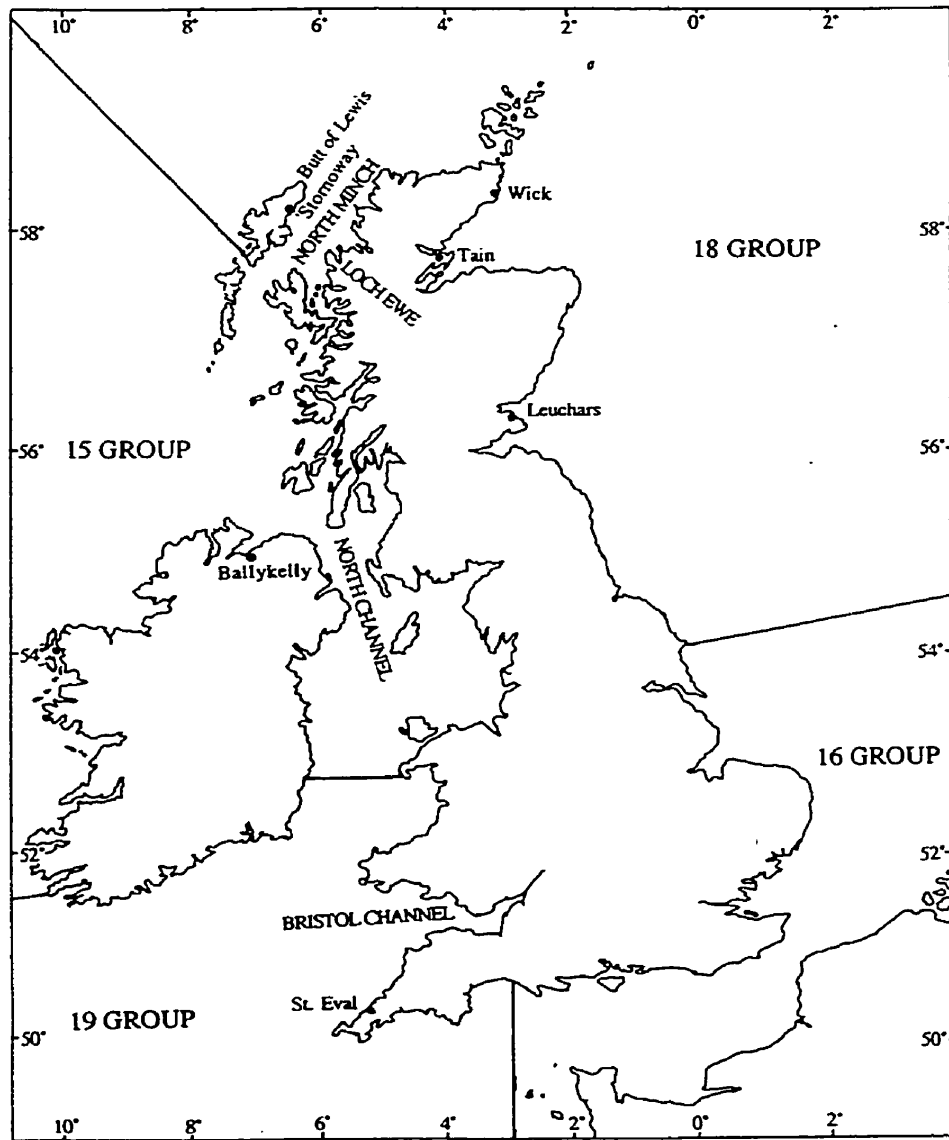
SOURCE: Oxford Atlas of the World, (London: George Philip Limited, 1992), maps 12-13, "Scandinavia and the Baltic Lands".



Map 4

The Northern Transit Area

SOURCE: Great Britain, Air Ministry, Air Historical Branch, "The RAF in Maritime War, Volume V: The Atlantic and Home Waters - The Victorious Phase, June 1944 to May 1945," Map 14; 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), Map: "Maritime Air Operations in Northwest Europe 1941-1945".



Map 5

Coastal Command Bases and Group Areas

SOURCE: "Coastal Command Record of Operations, 1943-45," NAC RG 24, vol. C-12433, map "Coastal Command Stations, Including Satellites and A./S.R. Marine Craft Units".

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