Abstract

When Wing Commander E.H. Hitchins was Air Historian of the RCAF, he prepared a review based on official and unofficial sources of each year's flying and other operations of the Air Board, Canadian Air Force, and Royal Canadian Air Force from 1919 until 1939. Although this study was not intended for publication in its present form, it does contain a substantial body of information useful to students of the history of Canadian military aviation, which is not readily available from any other source.

Résumé

Quand le Commandant d'escadre E.H. Hitchins était l'historien de l'A.R.C. il prépara pour chacune des années (1919 à 1939) une rétrospective fondée sur les sources officielles et non-officielles, des vols et autres opérations effectués par la Commission de l'air, les Forces aériennes canadiennes, ainsi que le Corps d'Aviation Royal canadien. Bien que son étude n'ait pas été préparée pour fins de publication, elle contient néanmoins nombre de renseignements utiles aux étudiants qui s'intéressent à l'histoire de l'aviation militaire canadienne. Ces renseignements ne se retrouvent pas facilement dans aucune autre source.

Dedication

"A tribute must be paid to the operating staffs of the air services of Canada. Many Canadian pilots have records which, if they had been made in the full glare of publicity, would have made them famous. In Canada such work is done, not for its publicity value, but because it is urgently required in the development of the country. It is part of the day's work and it seems to pass unrecognized. Its value to the state and to those interests which have fostered it is none the less great." (Report on Civil Aviation, 1929; p. 6.).

CONTENTS

Chapter I		Formation of the Air Board	1
Chapter II	A.	The Canadian Air Force 1920-1921	12
	B.	C.A.F. Ensign	27
	C.	Constitution of the C.A.F. Association	31
Chapter III	A.	Flying Operations 1920	33
	B.	Secretariat	38
Chapter IV		Trans Canada Flight 1920	41
Chapter V	A.	Parliament in 1921	54
	B.	Flying Operations in 1921	56
	C.	Technical Services in 1921	65
Chapter VI	A.	Air Board 1922	66
	B.	Flying Operations in 1921	69
		Arctic Expeditions	79
		Wireless Communications	80
		Technical and Equipment Services	81
	C.	Canadian Air Force 1922	84
		Officer Personnel of the C.A.F.	88
	D.	Transition from Air Board to Department of National Defence	91
Chapter VII	A.	Parliament 1923	96
	B.	R.C.A.F. 1923	98
		Service Operations	
	C.	Civil Government Air Operations	104
		Vancouver	106
		High River	108
		Manitoba	109
		Ottawa	111
		Dartmouth	112
		Research	112
Chapter VIII	A.	Parliament 1924	114
	B.	The 'Birth' of the R.C.A.F.	116
		Personnel of the R.C.A.F.	118

	C.	Civil Government Air Operations 1924	127
		Vancouver	129
		High River	131
		Manitoba	133
		Ottawa	138
		Dartmouth	138
		Round-the-World Flights	139
Chapter IX	A.	Parliament 1925	141
	B.	R.C.A.F. 1925	142
		Dress Regulations	148
		Operation 'Eclipse'	149
		Personnel	150
	C.	Civil Government Air Operations	151
		Vancouver	151
		High River	153
		Manitoba	156
		Ottawa	160
		Dartmouth	160
		Photographic Section	161
Chapter X	A.	Parliament 1926	162
	B.	R.C.A.F.	164
	C.	Civil Air Operations	167
		Vancouver	168
		High River	169
		Manitoba	170
		Ottawa	173
		Aircraft	174
		Trans-Canada Seaplane Flight	175
Chapter XI	A.	Parliament 1927	177
	B.	Reorganization of the Air Services 1927	181
	C.	R.C.A.F.	183
		New Construction	187
	D.	Civil Government Air Operations	188
		Crop and Forest Dusting	190
		High River	192
		Winnipeg	193
		Forestry Patrol	194
		Aerial Photography	195
		Ottawa	195
		Dartmouth	197
		Vancouver	197
		Hudson Strait Expedition	197
	E.	Aeronautical Engineering Division	205

Chapter XII	A.	Parliament 1928	206
	B.	R.C.A.F.	208
		Construction	210
		New Aircraft	210
	C.	Civil Government Air Operations	211
		Photographic Survey	211
		Dusting Experiments	214
		High River	214
		Winnipeg	214
		Ottawa	216
		Radio Communications	217
		Radio Aids to Navigation	219
	D.	Aeronautical Engineering Division	220
		Canadian Aircraft Industry	220
Chapter XIII	A.	Parliament 1929	222
	B.	R.C.A.F.	224
	C.	Civil Government Air Operations	227
		Forestry Patrol	227
		Photographic Operations	229
		Forest Dusting Experiments	230
		Winter-flying Experiments	231
		C.G.A.O. Stations	232
	D.	Aeronautical Engineering Division	234
Chapter XIV	A.	Parliament 1930	235
	B.	R.C.A.F.	235
		Instrument Flying	237
		Medical Services	239
		Engineer Services	239
		Aircraft	239
	C.	Civil Government Air Operations	240
		Forestry Patrol	240
		Aerial Photography	240
		Flights to the Arctic Coast	241
		Crop Dusting	243
		Miscellaneous Operations	243
		Bases and Detachments	244
	D.	Aeronautical Engineering Division	245
Chapter XV	A.	Parliament 1931	246
	B.	R.C.A.F.	248
		Army Services	251
	C.	Civil Government Air Operations	253
		Stations	256
		Annual Reports	257

	D.	Aeronautical Engineering	258
Chapter XVI	A.	"The Big Cut" 1932	259
	B.	R.C.A.F.	263
		Non-Permanent and Reserve	265
		Training	266
		Army Services	267
	C.	Civil Government Air Operations	269
	D.	Aeronautical Engineering Division	274
Chapter XVII	A.	Parliament 1933	276
	B.	R.C.A.F.	278
		Training	280
		Rifle Associations	282
	C.	Civil Government Air Operations	282
		Other Operations	283
		Summary of Flying	284
	D.	Aeronautical Engineering	285
		Engineer Services	286
Chapter XVIII	A.	Parliament 1934	287
	B.	R.C.A.F.	289
		Organization and Training	289
		Aircraft	289
		Strength and Organization	289
		Non-Permanent	291
	C.	Operations	293
	D.	Training	295
		Signals	296
		R.A.F. 'Fury' Visit	297
		Aerodrome Development	297
	E.	Aeronautical Engineering	298
Chapter XIX	A.	Parliament 1935	300
	B.	R.C.A.F.	302
		Strength and Organization	302
		Non-Permanent Active Air Force	303
		Construction	304
		R.C.A.F. Flying Time	304
		Honours and Awards	304
	C.	Operations	305
	D.	Training	306
		Signals	307

E. Aeronautical Engineering 309

Chapter XX A. Parliament 1936 310

B. R.C.A.F. 313
Strength and Organization 313
Aircraft 313
Personnel 315
Organization 315
R.C.A.F. Flying Time 317

C. Operations 318

D. Training 320
The Trenton Tornado 322

E. Signals, Engineering, Construction 324
Signals 324
Aeronautical Engineering 324
Construction 325
Survey of Industry 325

Chapter XXI A. Parliament 1937 326

B. R.C.A.F. 330
Strength 330
Organization - P.A.A.F. 330
Organization - N.P.A.A.F. 333
Airfield Development 333
Aircraft 334

C. Training 335
Signals 337
Armament 338
Equipment and Development 338
Engineer Services 339
Medical Services 339
Survey of Industry 340
Coronation of H.M. King George VI 340

D. Operations 340
Draft Report on Progress of Service Training to March 31st, 1938 344

Chapter XXII A. Parliament 1938 346

B. R.C.A.F. 358
Organization and Strength 358
R.C.A.F. Flying Time 362
Medical Services 362

C. Training 363
Air Cadets 366

D. Operations 367

	E.	Equipment and Development	368
		Photography	368
		Signals	368
		Armament	368
		Miscellaneous Equipment and Facilities	369
		Research	369
		Survey of Industry	369
	F.	Construction	370
Chapter XXIII		The Last Months of Peace	371
	A.	Parliament	371
	B.	R.C.A.F.	378
		Organization and Strength	378
		Aircraft	380
	C.	Operations	383
		Royal Visit	383
		Photography	383
	D.	Training	386
		Service Training	386
		Flying Training	386
		Medical Services	388
		Expenditures	388
	E.	Mobilization for War	389
Chapter XXIV		Civil Aviation	394
		Appendix A - Gift Aircraft	407
		Appendix B - Canadian Air Force Association Provincial Branch Executive Committees	408
		Appendix C1 - Airmen Discharged from the RCAF on Termination of Engagement, 31 March 1924	411
		Appendix C2 - Nominal Roll of Officers Appointed to the RCAF on 1 April 1924	423
		Appendix C3 - Nominal Roll of Airmen Attested and Enlisted in the RCAF on 1 April 1924	427
		Appendix C4 - Appointments and Enlistments in the RCAF, 2 April - 31 December 1924	436
		Appendix C5 - Personnel of the RCAF, 1 April - 31 December 1924, by Stations	446
		Appendix D - Abbreviations	456
		Index	459

Chapter 1

Formation of the Air Board

1919-1920

When the armistice of 11 November 1918 ended hostilities along the Western Front in Europe, the Canadian government was engaged in forming two "national" air forces for service at home and overseas. Four years earlier when the First Canadian Contingent sailed for Britain, a small Canadian Aviation Corps, consisting of one aircraft and two officers, had accompanied the troops. But the first halting step in the development of Canadian air power had been ill-fated, and through the next three years the Canadian government, despite several invitations from the British government, took no further action to develop Canadian air units. Then, in the last months of the war, two different factors - the great reputation won by Canadian airmen in the British air services, and the growing menace of enemy submarines on the high seas - stimulated the Canadian authorities to take to the air again.

At home, the Department of the Naval Service, acting on a suggestion from the British Admiralty, started in June 1918 to organize a naval air service for coastal patrol and shipping escort against enemy U-boats operating in the western Atlantic. Sites were acquired for two bases at Halifax (Dartmouth) and North Sydney (Kelly Beach) in Nova Scotia, from which units of the U.S. Naval Flying Corps carried out operations during the last few months of the war.(1) In September 1918, after the two bases had been constructed and the American naval air units installed, the establishment of the Royal Canadian Naval Air Service was authorized and the recruiting of personnel began. One group of trainees was sent to the United States for instruction on heavier-than-air craft, while a second group went to the United Kingdom for training in lighter-than-air. The war ended, however, before either group had returned to Canada. A few weeks later, on 5 December 1918, the R.C.N.A.S. was disbanded. Attached to the disbandment order was a cautious proviso "for the time being", and for some months an Acting Director for the R.C.N.A.S. was retained on the staff of Naval Headquarters. "The time being" however proved to be a generation. Finally, in December 1948, the air station at Dartmouth was transferred to the R.C.N. to be used for the purpose for which it had originally been constructed thirty years earlier - the land base of the Canadian Navy's air arm.

Meanwhile, in the last months of 1918, a second Canadian air service had started to take shape overseas in Britain. After long discussions between the two governments an agreement had been reached to form all-Canadian air squadrons in the Royal Air Force and, as the first step towards that objective, ground

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(1) Because of the urgency in getting the work done before the ground froze, construction of the two bases was done on a cost plus basis, rather than by normal contract procedure. At Dartmouth the expenditure was $335,798.94 and at Sydney $238,643.45. See Official Report of the Debates of the House of Commons of the Dominion of Canada, Second Session 13th Parliament (1919); Vol. II, pp. 1263-65, 1272-78, and 1532. (Hereinafter cited as "Hansard".)

personnel were recruited from Canadian Army units and sent to RAF schools for technical training. Although the Armistice intervened before any further action was taken, the Canadian authorities decided to proceed with the formation of a Canadian Air Force. Accordingly, on 20 November 1918, two squadrons were formed at Upper Heyford, composed of Canadian pilots and observers who had served in the RAF and Canadian ground personnel who had been trained in RAF schools.(2) Early in 1919, No. 1 Canadian Wing was established as "a purely Canadian unit" to administer the two squadrons. At the Headquarters of the Overseas Military Forces of Canada it was intended and expected that this embryo CAF would be transferred to Canada to serve as the nucleus of the Dominion's post-war air force, and staff officers had many discussions with Air Ministry officials to obtain data concerning establishments, aircraft types, operating and maintenance costs upon which to base their plans. At Ottawa, where Canada's post-war aviation policy was still under consideration in the early weeks of 1919, there was more concern with prospective civil and commercial developments than with the remote problem of air defence.

Parliament opened its first post-war session on 20 February 1919. A fortnight later Lt. Col. Alfred Thompson, the member for Yukon, in a speech remarkable for its foresight, referred to "a new system of transportation....the highways of the air" and declared that "Canada is on this great highway of aerial commerce which is about to be made". He suggested various ways in which airships and airplanes could be used in the Dominion, for transportation down the Mackenzie River and in the Yukon, for mineral resources exploration between Hudson Bay and the Mackenzie, for ice and weather patrols in Hudson Strait, for photographic survey, and for RCMP services to isolated posts.(3) Another member, who asked what the policy of the government was with regard to encouraging aviation and what was being done to encourage pilots and mechanics to remain in Canada, was told that "the policy of the Government....is at present under consideration and will be announced at a later date."(4)

The Government's aviation policy was first indicated on 29 April 1919 when the Hon. A.K. Maclean, Minister without Portfolio, moved for leave to introduce a bill to authorize the appointment of an Air Board for the control of aeronautics. After briefly outlining the duties proposed for the Board, he added that "it is deemed advisable to constitute a board for the time being as the most practicable method of dealing with this new subject". Possibly after a year's trial some other legislation might be considered necessary.(5) When the bill came up for detailed examination in committee on 5 May, Mr. Maclean again emphasized the temporary nature of the measure:

> "Speaking generally, the Government has no settled policy in respect to aeronautics... It was necessary to first enact legislation before any fixed policy could be

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(2) In the R.A.F. the two squadrons were designated Nos. 81 and 123; the Canadians referred to them as No. 1 Scout and No. 2 Day Bombing Squadrons.
(3) Hansard, 1919 Session; Vol. I, pp. 302-6.
(4) Ibid.; Vol. II, p. 1340. Question asked by Mr. S.F. Tolmie (Victoria City) on 10 April 1919.
(5) Ibid.; Vol. II, pp.1864-5.

> adopted by the Government in respect of any form of aeronautical activity... It is open to the Government to embark upon various forms of aerial activities, such as the conveyance of the mails, the survey of forests, fire protection, patrols by the mounted police, and so forth, but at the present time, the Government has reached no definite policy in respect of any of these matters".

He pointed out that there was at present no statutory authority for granting licenses for pilots, aircraft, air routes and such matters, and that "the immediate purpose" of the proposed bill was to provide such control for aeronautics in Canada, whether established by a government department or by private corporation. It was not proposed to establish a new department to administer the act; the Chairman of the Air Board would be one of the Ministers and the actual administration would be largely in the hands of the vice-chairman who would be "the chief executive officer."(6) He repeated again:

> "... it will be understood that this measure is of a temporary nature. I have no doubt that in the working of it during the coming year weaknesses will develop but experience will enable us to pass legislation which will be more satisfactory."

One member commented that the intention seemed to be "to set up a theoretical Board rather than a practical one" since there had been no mention of Canadian airmen who had seen service on the battlefields of Europe.(7) Two other members (Mr. Ernest Lapointe, Kamouraska, and Mr. R. Lemieux, Maisonneuve) questioned the authority of Parliament to control aeronautics within a province and suggested it was contrary to the terms of the British North America Act. Mr. Maclean agreed the point was open to very much doubt which might have to be settled in court.(8)

Most of the discussion in the debate, which lasted less than two hours, centred on Section 3 of the bill which defined the duties of the Air Board. In his explanation of the bill Mr. Maclean had said that operations under the act would largely relate to commercial activities; he expected that "for the next few years at least naval and military activities in aeronautics will be very limited indeed." In reply to some comments about Camp Borden, Major-General S.C. Mewburn, the Minister of Militia and Defence, remarked that "it was difficult for us to determine from a military standpoint what should be done as regards the air force", but with the acquisition of Camp Borden and some

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(6) In reply to some members who asked what department the Air Board would come under, Mr. Maclean said it would be under both the Militia and the Naval Departments, to which Gen. Mewburn added that it was not settled which minister would be responsible for its administration.

(7) Some members suggested that Col. W.A. Bishop should be a member of the Board, and another urged that the sympathy and help of Dr. Alexander Graham Bell, "the father of aeronautics in this country", should be enlisted. Gen. Mewburn replied that he did not think that any salary the Militia Department could offer would attract Col. Bishop.

(8) The question of federal-provincial jurisdiction was eventually carried to the Privy Council which upheld the power of the federal government (Privy Council Appeal No. 38 of 23 October 1931).

aircraft "we have the facilities for continuing training and developing an air force in the future... If we have to reorganize the militia for defence and other purposes, no doubt an air force will form part of it. That, however, was one of the subjects that we decided the commission would deal with." Like Mr. Maclean he emphasized that the Air Board was "only a temporary one to study the question" of commercial and civil development.

After some discussion of possible mail services, forest protection, photographic survey, seal and fishery reconnaissance, members congratulated the Government on its good judgment in presenting the measure so promptly to Parliament. Mr. H.M. Mowat, member for Parkdale, expressed the view that the bill should pass at this session, even if it was not wholly adequate to provide for all cases, "so that the world may know that Canada is, as usual, in the van in regard to improvements in science."(9)

On 6 May 1919 the bill received its third reading and was given Royal Assent on 6 June 1919.(10) The Act provided for "a Board on Aeronautics", called the Air Board, to consist of not less than five nor more than seven members appointed by Governor in Council for a term of three years. The Chairman was to be a Minister of the Crown, and there was also to be a Vice-chairman; one member was to represent the Department of Militia and Defence and another the Department of the Naval Service. Salaries of the members were to be determined by Governor in Council.

The duties of the Air Board were most comprehensive. After summing them up in one general clause, "to supervise all matters connected with aeronautics", the Act spelled them out in twelve further clauses: to study the development of aeronautics in Canada and abroad and undertake such technical research as might be requisite; to construct and maintain all government air stations; to control and manage all aircraft and equipment necessary for His Majesty's services; to operate such services as the Governor in Council may approve; to prescribe aerial routes; to assist other officers of the Crown in carrying out services which required aerial work of any nature; to take such action as may be necessary to secure Canadian rights in international air routes; "to co-operate with the officers of the Departments of Militia and Defence and of the Naval Services on all questions relating to the air defence of Canada"; to co-operate with other governments for any purposes pertaining to air services; to investigate and report on all proposals for commercial air services within or partly within Canadian territory or waters; to draft for approval by Governor in Council such regulations as may be necessary for the control or operation of aeronautics; and finally "to perform such other duties as the Governor in Council may from time to time impose."

To carry out these sweeping duties the Air Board was empowered, subject to approval by the Governor in Council, "to

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(9) Hansard, 1919 Session; Vol. II, pp. 2050-61. When one member suggested that some aircraft be reserved for the exclusive use of ministers of the Crown, Gen. Mewburn quipped "You would not want to see the ministers any more up in the air than they are now, would you?"

(10) 9-10 George V, Chap. 11. An Act to authorize the appointment of an Air Board for the control of Aeronautics.

regulate and control aerial navigation over Canada and the territorial waters of Canada", and in particular to make regulations for licensing pilots, aircraft and air stations, for the transport of goods, mails and passengers, for the prohibition of flying over certain areas, for the use and control of air routes, for the institution and enforcement of laws, rules and regulations necessary for the safe and proper navigation of aircraft, and for the organization, discipline, efficiency and good government of officers and men employed under the Air Board.

Finally, the Air Board was given power "to employ such officers and men ... as may be authorized by the Governor in Council, under such conditions as to discipline and pay as the Governor in Council may determine, and may make such arrangements for their proper training, housing, board, clothing and equipment as may be deemed necessary and as may be approved by the Governor in Council". The Board was also authorized to employ a civil staff.

In the closing days of the session (5 July 1919) an estimate of $250,000 for the air service was submitted to the House and agreed to without debate. In explaining the item Gen. Newburn said that the Minister of Customs (the Hon. A.L. Sifton) had been appointed chairman of the Air Board. The sum appropriated was for organizing the Board, taking care of machines, and drawing up regulations for aerial navigation in Canada which it was hoped would develop on commercial lines. Originally it had been suggested that $500,000 would be required for the fiscal year, but this sum was cut down "and they think that $250,000 will more than cover it. It is only in the experimental stage as yet".(11)

The relatively small sum required by the Air Board in its first year was largely due to the fact that only administrative expenses had to be met; virtually everything else - air stations, buildings, aircraft and equipment - was already available. In addition to the two air stations which the Canadian government had constructed at Dartmouth and North Sydney, there were the airfields which the government of the United Kingdom had developed in Ontario in 1917 and 1918 for the training of pilots and observers for the Royal Flying Corps and Royal Air Force. In aircraft and other equipment the Air Board also started out well found. When the U.S. Naval Flying Corps withdrew from Dartmouth and North Sydney it left behind, as a donation to the Canadian government, 12 Curtiss HS2L flying-boats, and 25 Liberty engines as well as other equipment. Still more generous was a donation from the government of the United Kingdom. On 4 June 1919, just before the Air Board Act became law, the government of the United Kingdom, anxious to encourage and assist the Dominions in establishing their own air forces (for which some proposals had been made in the early days of the war), offered to donate to each of the Dominions 100 aircraft together with all the necessary spares, stores and equipment. As a result of this offer Canada, after some discussion about types that would be most useful in the aerial development of the Dominion, received 80 aeroplanes, 14 flying-boats, 12 non-rigid airships and six kite-balloons together with hangars, sheds, inflating plants, spare parts, armament, wireless

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(11) Hansard, 1919 Session; Vol. V, p. 4687. Actual expenditure by the Air Board in the 1919-20 fiscal year was $109,464.

instruments, cameras, technical equipment, vehicles and other material.(12) The total value of this donation was at least $5,000,000 - a sum greater than that which the Canadian government spent on aviation during the four years 1919-20 to 1922-23.

In the spring of 1919 when Canada's military air policy was still undefined, the embryo Canadian Air Force in Britain started to disband; the major function of the small number of officers and airmen who remained during the latter part of that year was to pack and ship the gift aircraft and equipment to Canada. On 28 January 1920 one of the two squadrons in the CAF formally disbanded, followed on 5 February by the second squadron and the wing headquarters. Thereafter only a small Canadian Packing Section remained at Shoreham to complete the job of shipping the aircraft and equipment home. By the time the CAF ceased to exist overseas, plans were in hand to form a new CAF in Canada.

Pursuant to the Act of 6 June 1919, an Air Board was constituted by Order-in-Council on 23 June 1919, consisting of the Hon. A.L. Sifton, PC., KC., as Chairman and Col. O.M. Biggar, K.C. as Vice-chairman, with the Hon. S.C. Mewburn, CMG, the Hon. C.C. Ballantyne, Dr. R.M. Coulter, Mr. J.A. Wilson and Mr. E.S. Busby as the other members.(13) After consultation with the Civil Service Commission, the Board decided to organize its work in three branches - Flying Operations to control all civil government flying, Certificate Branch for the licensing of personnel, aircraft and air harbours, and Secretary to administer the internal organization. This proposed organization was formally communicated to the Civil Service Commission on 15 July 1919, with a request that officers should be appointed to head the three branches and, in addition, a medical officer for duty with the

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(12) This donation was in addition to 16 aircraft, worth approximately $100,000, which the Air Ministry gave to Canada as replacement for "gift" machines that had been presented to Britain during the war by the Overseas Club and other agencies. Canada also received a number of enemy aircraft as part of a collection of war trophies. The gift aircraft received from these various sources included 62 Avro 504K, 23 D.H.4 and D.H.9a, 12 S.E.5a, 8 F.3 flying-boats, 2 Curtiss H.16 flying-boats, 2 Bristol Fighter, 2 Sopwith Snipe, and 1 Fairey seaplane (from the Air Ministry and Overseas Club), 12 Curtiss HS2L flying-boats (from the U.S. Navy through the Department of the Naval Service), and 10 Curtiss JN4 (from the Department of Militia and Defence). See Appendix A. Some of the gift tools and other equipment were still in use on the eve of the Second World War. In 1938 the Equipment Depot at Winnipeg received from No. 1 Aircraft Depot at Victoria Island, Ottawa, a quantity of stores, some of which were of 1918 design; and the gantry which had been used at Camp Borden for aircraft assembly and engine changes from 1920 on was still there in 1939, being used in the late summer of that year to erect the first Fairey Battles sent out to Canada.

(13) P.C. 1295 of 23 June 1919. Mr. Sifton was the Minister of Customs, Col. Biggar the Judge Advocate General, Gen. Mewburn the Minister of Militia and Defence, Mr. Ballantyne the Minister of the Naval Service, Dr. Coulter the Deputy Postmaster General, Mr. Wilson the Assistant Deputy Minister in the Department of the Naval Service, and Mr. Busby the Chief Inspector in the Department of Customs and Inland Revenue. Mr. Sifton later became Secretary of State and was appointed to the Privy Council of the United Kingdom.

Certificate Branch.[14] Several months elapsed, however, before the appointments were made.

With the appointment of Lt. Col. J.S. Scott, MC, AFC as Superintendent of the Certificate Branch on 3 November 1919 the organization of the Air Board began to take shape. A week later Major A.M. Shook, DSO, DSC, AFC took office as Secretary of the Board, and Capt. F.R. Smith was designated medical officer for the Certificate Branch. Finally, on 15 December, Lt. Col. R. Leckie, DSO, DSC, DFC assumed the duties of Superintendent of Flying Operations. With the acquisition of permanent office accommodation for the staff on 24 December the Air Board was ready to function as the controlling body for civil government, commercial and civil aviation.

Meanwhile the first steps had been taken for the regulation of aerial navigation within the country. After issuing an order to prohibit dangerous flying[15], the Board began drafting a complete set of air regulations based on the International Convention for Air Navigation. The regulations were approved by the Governor in Council on 31 December 1919, published in "The Canada Gazette" on 17 January 1920, and issued in booklet form.[16] In the regulation of air traffic Canada led the way, being the first country "to enact a complete set of Air Regulations covering the whole question."

While drafting the regulations the Air Board also undertook, in November 1919, a preliminary survey to ascertain "what public services could more efficiently, and in the broadest sense more economically, be performed by air than by existing methods." The survey, carried out by ex-Royal Air Force officers who were borrowed or temporarily employed for the purpose, was completed by the end of the year, and on 2 January 1920 the officers met in Ottawa to thoroughly canvass the situation, with the result that it was decided that the most favourable fields for the commencement of operations were the less thickly settled and less thoroughly explored portions of Canada. An interdepartmental conference was then convened on 10 January to discuss the probable cost of operating aircraft, their use for survey and fire protection, and the utility of various places suggested as possible air stations. Although the usefulness of this preliminary conference was diminished by the non-participation of some departments which it had been expected would be interested, special discussions were subsequently carried on with certain departments and proposals were formulated for air operations in the summer of 1920.[17]

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(14) Report of the Air Board for the Fiscal Year ending March 31, 1920; p. 5. The Civil Service Commission advertised in "The Canada Gazette" on 26 July 1919 for a Superintendent of Flying Operations ($4500), a Superintendent of Certificate Branch ($3600), a Secretary ($3000), and a Medical Officer ($2400).

(15) P.C. 1379 of 7 July 1919.

(16) Air Regulations 1920 with which are printed the Air Board Act, the Convention relating to International Air Navigation, and certain Directions given and Forms approved for use under the Regulations. King's Printer, Ottawa, 1920; pp. 139. The Order-in-Council was P.C. 2596 of 31 December 1919.

(17) Air Board Report, 1920: p. 6.

Early action was likewise taken to provide other services and facilities for aviation in Canada. In compliance with its duty to undertake technical research for the development of aeronautics the Air Board held discussions with the Honorary Advisory Council for Scientific and Industrial Research, following which an Associate Air Research Committee was formed under the Council and met for the first time on 7 February 1920. Dr. A.S. Eve, Professor of Physics at McGill University, was named chairman of the Committee, with Mr. R.J. Durley as secretary; the other members were Prof. J.C. McLennan and Mr. J.H. Parkin, both of the University of Toronto. Later in the year (30 October 1920) Lt. Col. E.W. Stedman, OBE was appointed Director of Technical Services in the Air Board.

Arrangements were made with Sir Frederick Stupart, Director of the Meteorological Service of Canada, to provide meteorological reports, undertake observations at Air Board stations and distribute meteorological information. The General Superintendent of the Government Radio Telegraph Service in the Department of the Naval Service arranged for an extension of wireless communication to assist air navigation, and that department also undertook to issue licenses for wireless installations in aircraft and on the ground, and to examine air pilots who required wireless qualifications. Similarly, it was proposed to have the Department of Marine and Fisheries issue navigators' certificates to air pilots who desired them. In the establishment of an aeronautical intelligence branch the Air Board was aided by the work which had been carried on for two years overseas by the Intelligence Branch of the Canadian Air Force. On the demobilization of the Canadian Expeditionary Force the material collected by that branch was transferred to the Air Board, which also secured the services of the officer, Capt. F.C. Higgins, who had been chiefly responsible for the CAF's intelligence work.(18)

While laying the essential bases for the development and regulation of civil government, commercial and civil aviation, the Air Board also gave consideration to military aviation and set forth its views on that subject in a report which was submitted to Governor-in-Council for approval and duly authorized by Order-in-Council on 18 February 1920.(19) As the first statement of Canadian military air policy, and the basis upon which Canada's fourth air service was established, the document is of considerable interest.

The members of the Air Board introduced their recommendations on "the general principles which should underlie the organization of an Air Force in Canada" with the observation that "if Canada is again obliged to engage in war, it will be necessary for her to rely upon an air force as well as upon land and sea forces, and the longer the period intervening before the commencement of such a war, the greater will probably be the importance of the air force by comparison with these other forces." The maintenance

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(18) His appointment as Aeronautical Intelligence Officer was effective 22 April 1920.

(19) P.C. 395 of 18 February 1920. Although the Order says that the Air Board report was dated 29 November 1919, it apparently was not adopted by the Board for submission to Privy Council until 22 December. "A final decision on this subject (the C.A.F.) was .. postponed until the general policy with regard to Canada's future sea, land and air forces was determined." Air Board Report, 1919; p. 7.

of "an exclusively military air force", however, presented many problems: aircraft and their highly technical equipment were expensive and deteriorated very rapidly, even if unused; a very high degree of special skill was required both in the air and on the ground;(20) the high standard of mental and physical condition required for war flying meant that the profession of a military air force officer would be a "blind alley" profession from which he would have to retire at a comparatively early age; and finally the high cost of a professional military air force would keep it so small as to be almost negligible in war. "These difficulties and objections (the report continued) weigh so strongly against a purely military air force as to practically exclude resort to it." Although some of the difficulties might be overcome by employing air force personnel on useful civil duties, such as carrying mail and surveying, on the whole those duties could be performed just as well, if not better, as civil services, "and uncertainty on the point of the primary or ultimate purpose of an organization always results in confusion and inefficiency."

On these premises the Air Board based its conclusions "that war strength in the air must ultimately depend upon civil or commercial air strength; that most of the members of a war air force must normally pursue peaceful occupations (preferably but not necessarily, in connection with air navigation), that war formations should exist only upon paper and not in the form of embodied units, and that war training should be periodic, intensive and widespread."

> "Such war training, which must include instruction in the use of many types of machines and complicated and various technical equipment, should be carried on at well-organized and thoroughly-equipped training stations. At least a small part of the staff at such stations would necessarily be continuously employed, but the size of this professional nucleus must be kept within the narrowest possible limits, partly on account of the expense involved not only for the pay but also for the pension of its members, and partly because it cannot in Canada be made large enough to offer to the best type of young man a sufficiently attractive career."

> "In peace even the instructional and administrative personnel at the training stations should consequently with the fewest exceptions, be civilians temporarily assuming military duty. It is obvious that this would result in a lower peace efficiency than if a more numerous permanent professional military personnel were relied upon, but peace efficiency is not the primary consideration. A war organization so constructed as to be comparatively inefficient in peace but reasonably efficient in war is very greatly to be preferred to a war organization which shows a high degree of efficiency in peace but breaks down when it is called upon for war service."

In the opinion of the Air Board, officers and airmen, once they had been trained, would retain their efficiency if they

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(20) The report pointed out that this skill, "unlike almost all other military skill, is capable in a large measure of useful exercise in peace."

received further training for one month every second year, "or in other words, ... the air force as a whole would be maintained in a sufficient state of efficiency if one twenty-fourth of its total authorized non-professional strength was always on duty." The number of professional officers and airmen who would be required for the maintenance "of a reasonably efficient peace administration" could not be defined, but the Board thought that not more than twelve would be needed at each training station with an even smaller number at headquarters.

"In view of the considerations above set forth, and for the purpose of laying a foundation for the organization of a Canadian Air Force on the general lines indicated", the Air Board recommended three steps:

(a) that former officers and airmen of the Royal Air Force[21] be invited to offer their services as members of the Canadian Air Force upon the conditions that in peace time they would not normally be called upon for active duty for more than five weeks in any two years (including time spent in travelling to and from training centres), that they would receive pay only for the time so spent on active duty, and that for airmen the term of enlistment would be four years;

(b) that the Canadian Air Force be administered through provincial Air Force Associations, of which the Lieutenant Governors would be asked to serve as honorary presidents; the duties of each association, which would receive a small grant for a secretary and office accommodation, would be to maintain the "paper war formations" of the CAF in its province, keep a roster of officers and airmen, and select them in turn for their biennial tour of training; and

(c) that negotiations be opened with the Air Ministry to arrange that officers of the CAF who were on the Reserve of the RAF be released from any obligations in the latter capacity which might interfere with their duties in the CAF.

Several months elapsed before any further action was taken to build a Canadian Air Force upon the foundation embodied in the Order-in-Council of 18 February 1920. In the interval the first Air Board, having completed its task of laying the groundwork for Canada's civil, commercial and military air development, resigned and on 19 April 1920 a new Board was appointed.[22] Col. Biggar, member of the original Board, continued in office as Vice-chairman. The new Chairman was the Hon. Hugh Guthrie who had recently been appointed Minister of Militia and Defence. The heads of the three major branches of the Air Board now became "executive members" of that body with the appointment of Lt. Col. Robert Leckie, the Director of Flying Operations, Lt. Col. J.S. Scott, the Controller of Civil Aviation, and Sir Willoughby Gwatkin, former Chief of the General Staff who a few days later became Inspector-General of the Canadian Air Force. The remaining positions on the Board as "advisory members" were filled by Capt. W. Hose, Director of the Naval Service, and Dr. E. Deville, the Surveyor General. Mr. J.A. Wilson, a member

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(21) The Air Board estimated that there were in Canada more than 12,000 officers and airmen who had served overseas with the R.A.F. and a large additional number who had served only in Canada.
(22) P.C. 826 of 19 April 1920.

of the original Air Board, relinquished his position as Assistant Deputy Minister in the Department of the Naval Service, to become Secretary of the Air Board in succession to Major Shook who had been forced to resign because of ill health.

Chapter II

A. The Canadian Air Force 1920-1921

On 18 February 1920 the government approved the recommendations of the Air Board for the formation of a non-permanent, non-professional Canadian Air Force, and that was the effective date of all the original commissions granted in the new CAF. The first specific step in the formation of the force was not taken, however, until two months later when, on 23 April 1920, a few days after the new Air Board was constituted, authority was granted to employ a small staff of three officers and three other ranks for a period of six months to complete the organization of the provincial branches of the CAF Association, to prepare the establishments of the squadrons and other units, to draft regulations for the discipline, pay, training, housing, board, clothing and equipment of personnel, and "to do such other duties as the organization of the Canadian Air Force may involve."(1)

On the same day that this Order-in-Council was passed (23 April 1920), Major-General Sir Willoughby Gwatkin was appointed Inspector-General of the Canadian Air Force with the rank of air vice-marshal. In the next few weeks the six positions authorized for the small CAF headquarters staff were filled by the appointment of Lieut.-Col. A.K. Tylee, OBE, as Commanding Officer with the provisional rank of air commodore (17 May 1920), R.F. Redpath as wing commander (8 June), and G.J. Blackmore as flight lieutenant (21 June), while Warrant Officer H.H. Atkinson, Flight Sergeant F. Aldridge and Sergeant A.H. McKay were attested and enlisted as the clerical staff (30 May, 5 June and 17 July respectively).(2) CAF headquarters staff officially formed in the Air Board offices at 529 Sussex Street in Ottawa on 17 May 1920, the date of A/C Tylee's appointment.

By letters patent dated 8 June 1920, six members of the Air Board(3) were incorporated as the "Canadian Air Force Association", the purpose of which was "to promote the efficiency and advance the interests of the Canadian Air Force and to assume such share of the administration of such force ... as may be authorized by the Governor in Council."(4) Within the Association seven principal branches were organized, the three maritime provinces being grouped together in one branch. All the commissioned officers ordinarily resident in the several provinces comprised the membership of the branches(5) with the respective lieutenant-governors serving as honorary presidents. Each branch was managed

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(1) P.C. 876 of 23 April 1920. The six officers and men were to be granted temporary rank in the CAF as air commodore, wing commander, flight lieutenant, sergeant major (technical, group 1, class 1), sergeant major (technical, group 1 class 2), and corporal (technical, group 1). Pending the determination of pay and allowances for the CAF, they were to receive remuneration corresponding to RAF ranks, calculated at par of exchange.

(2) Tylee's appointment was for a period of nine months, Redpath's and Blackmore's initially for five months (later extended); the three NCOs were placed on duty for terms of six to eight and a half months, subsequently extended indefinitely.

(3) Guthrie, Biggar, Gwatkin, Leckie, Scott and Deville; Capt. Hose was not included.

(4) "The Canada Gazette", Vol. LIII, No. 51; p. 4465. Public notice issued by the Secretary of State, 16 June 1920.

by an executive committee of seven members serving, normally, for a two-year term. Three members of the committee were nominated by the lieutenant-governor (in the case of the Maritime Provinces Branch one by each of the three lieutenant-governors); the other four members, who represented the CAF, were elected by the officers comprising the branch. The executive committee served without remuneration, but it was authorized to appoint a secretary who was paid for his services, and a grant was also provided for office expenses.

The duties of the executive committee were:

"(a) To keep a roster of all the officers and airmen of the Canadian Air Force ordinarily resident in the Province.

(b) If required, to maintain lists of the personnel belonging to each of the squadrons or other units of the Force authorized to be formed in the Province, and to insure that every such squadron or other unit is kept up to establishment, and that each individual belonging thereto is familiar with his duty upon mobilization.

(c) To select, in such numbers in each rank as the Air Board may direct, the officers and airmen who are to report for training at the prescribed dates and training centres, to select alternates when necessary to supply vacancies, and to issue the necessary directions or orders for the attendance of the officers and airmen so selected.

(d) To select officers to constitute Boards of Enquiry in cases of accidents or alleged breach of regulations when such Boards are authorized by the Air Board.

(e) To make all the necessary suggestions and to take such action as may be required in accordance with regulations for the recruitment and administration of the CAF in the Province, and

(f) Generally to advance the interests of the Canadian Air Force."(6)

An executive committee for the Ontario branch was appointed on 29 May, followed by Alberta on 9 June, Manitoba on 10 June, Saskatchewan on 22 June, British Columbia on 23 June, Quebec on 28 June, and the Maritime Provinces between 21 June and 31 July.(7)

Meanwhile the invitation which had been extended to former officers and airmen of the RAF to join the new CAF had elicited an encouraging initial response, applications from 933 officers and 431 cadets and airmen being received by the middle of June. Preparation of Regulations for the CAF was in progress and it was anticipated that they would be ready for submission to Privy

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(6) CAF Weekly Order Ba. 1.
(7) The original committees were appointed to serve until 31 March 1921; elections were then held for the four C.A.F. representatives on each committee. For the composition of the provincial executive committees see Appendix B.

Council before 1 August. In the interim the Air Board wished to set up a provisional organization for the force and to open the training centre at Camp Borden. Accordingly, the Board, on 17 June, submitted its recommendations for a CAF establishment, requesting authority to commission and enlist without pay 1340 officers and 3905 airmen;(8) the Board also asked for authority to place on duty a party, not exceeding 60 in number, at Camp Borden until 1 August, to prepare the quarters and equipment, "at the same rates of pay and allowances and under the same disciplinary and other regulations as presently apply to the Royal Air Force." These recommendations were approved by Order-in-Council on 30 June 1920.(9)

To finance its operations the Air Board received an appropriation of $1,900,000 for the 1920-21 fiscal year, the sum being divided into $1,100,000 for civil aviation and $800,000 for military. The second item did not pass without opposition. Early in the session the government had submitted to the House a main Estimate of $250,000 for civil aviation (the same amount as for the previous year). Then, in the closing days of the session, on 30 June - the same day on which the Order-in-Council was passed approving the provisional establishment for the CAF - two supplementary estimates were submitted for $850,000 for civil aviation and $800,000 for the CAF. Mr. Guthrie told the House, sitting in Committee of Supply, that a paper establishment had been authorized for a total of 5,000 all ranks to retain the interest of trained airmen "in case in the future it may develop for commercial, scientific or other purposes as well as military operations." All that was necessary for the air force was "to give a limited training to a limited number of airmen in Canada to keep their hands and their eyes in." This would be arranged through provincial associations which would enlist as many men as possible in the service. As the cost of flying was considerable - the minister said he understood it was about $6 an hour - it was only proposed to give each man one month's training of two hours' flying per day, and for the current year it was proposed to limit the number to about 1700 men. The objects of the Air Board, Mr. Guthrie continued, were by no means wholly military; it was also concerned with scientific and commercial aviation and with exploration. In addition to the training centre at Camp Borden, property for air stations had been acquired at Vancouver, Morley, and near Lake St. John in Quebec, as well as a small experimental station at Rockcliffe; the Lake St. John site (Roberval) had been secured on a 50-50 basis with the province of Quebec for exploration and scientific work. Suitable sites for airfields were being laid out for an air route across Canada. The minister concluded: "We must do something for the air service, and more particularly as we have in Canada perhaps the highest trained body of airmen that exists anywhere in the world today."

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(8) The proposed schedule of ranks was:

Officers		Airmen	
Air Commodore	2	Warrant Officer	78
Group Captain	3	Flight Sergeant	144
Wing Commander	21	Sergeant	451
Squadron Leader	61	Corporal	545
Flight Lieutenant	237	1/Air Mechanic	1302
Flying Officer	530	2/Air Mechanic	1185
Pilot Officer	486	Cadets attached	200
	1340		3905

(9) P.C. 1426 of 30 June 1920.

Mr. Mackenzie King immediately protested against the action of the Government in putting large sums in the supplementary rather than in the main estimates. It was not "treating Parliament or the country fairly" to put an item of $250,000 for the air service in the main estimates and then in the last two or three days of the session bring down a supplementary item of $1,650,000. It was a matter of habit, of deliberate design by the Government, and not a matter of chance; it was a highly objectionable course, detrimental to the public interest. To this criticism Mr. Guthrie replied that the Air Board could not be blamed as it was not known until the first week of May, when the gift aircraft and equipment were shipped to Canada, what funds would be required for the air service.

The attack then turned to these gift aircraft. Mr. A.R. McMaster said that their acceptance was apparently "going to impose upon this country a very substantial expenditure". The Government had accepted the gift without taking the people into its confidence, "and now it finds itself at this late hour of the session obliged to come before the House to meet very heavy obligations indeed." It would be a sad thing if the country was obliged to incur expenses which it was really unable to bear. Mr. King, Mr. Ernest Lapointe and Mr. Henri S. Béland supported their colleague. Mr. King charged that the British Government had adopted the policy of getting rid of its surplus war material by presenting it to the Dominions to reduce the cost of maintenance. Mr. Lapointe, agreeing that the gift "should be accepted by the Parliament of Canada and by nobody else", expressed the fear that it might involve further expense in imperial defence, which was to be discussed at a forthcoming Imperial Conference. In reply to these charges Mr. Guthrie said the aircraft had been arriving during the period from early April to the middle of June "and we have to take care of them." All the equipment was first class and up-to-date in every respect. He assumed that "the motives of the British Government in making this gift to Canada were absolutely proper."

Mr. Béland then broadened the opposition's attack by expressing doubts whether this large expenditure of roughly two million dollars "for an entirely new experiment in aviation" would produce any benefit in exploration or scientific results. The only use he could see was for the protection of forests against fire, and that required only a very small number of aviators. Was the country to launch on expenditures for aerial preparation as well as military and naval? What would the cost be next year? "The war is over, and the Government should put a stop to these expenditures." Mr. King closed the debate in a similar vein. "So far as this air service can be used for commercial, scientific, and exploration purposes it should be fostered, but to enter this year, before the work of demobilization is completed, upon an air service for military purposes is the height of absurdity." The initial estimate of $250,000 was "a pretty good sum with which to make experiments", and the supplementary item of $850,000 for civil aviation was surely all that the Government should ask for at this time. "We can well afford to dispense with the military end of it this year. I think that we should reduce the total vote for air service by $800,000." The item was then put to the committee and agreed to on division by 46 votes to 26.(10)

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(10) Hansard, 1920 Session; Vol. V, pp. 4553-56.

The Governor-General's speech closing the session of Parliament the next day (1 July 1920) included a paragraph on the air service:

"Provision for the air service has also been made in such a manner as will produce the largest trained personnel consistent with the financial capacity of the country. Because of Canada's peculiar geographical position and features, it is highly important that the possibilities of this new method of communication and transportation should be fully explored. The Air Board will be enabled to watch every new development and to take practical steps in the interests of aerial navigation in the Dominion." (11)

With an appropriation of $800,000, a provisional establishment of 5,245 officers and men, and authority to send a small party to Camp Borden, the Canadian Air Force immediately set to work to prepare its training centre. In May arrangements had been made with the Department of Militia and Defence for the Air Board to take over the airfield and buildings which had been constructed at Camp Borden for the use of the RFC/RAF during the war. The transfer was officially made on 5 July 1920, and an Advance Party was soon at work preparing the station and aircraft for the inauguration of training. S/L F.G. Pinder, who had been at the camp since 7 June, was joined by sixteen other officers and 35 airmen as the Advance Party, in the period between 5 July and 5 September.(12) The officers all received provisional appointments in rank and were "with their consent" placed on duty for specified periods of 38 days to six months "or such less period as their services may be required." The normal period of duty was four months with subsequent extensions in many cases of three months, after which many of the officers were placed on duty for an indefinite period. Two of the officers in the Advance Party, F/L N.R. Anderson and F/L A.A.L. Cuffe, eventually became members of the Permanent RCAF.(13) The airmen, most of whom were "fitters aero" by trade, were placed on duty for six months, with subsequent extensions in many cases. While the Advance Party was at Camp Borden one officer reported for training. He was W/C J. Stanley Scott, the Controller of Civil Aviation in the Air Board, who was "placed on duty, taken on strength for the normal training period" (without pay) and posted to Camp

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(11) Ibid., p. 4591

(12) Under the terms of P.C. 1426 of 30 June 1920, the advance party was to be on duty until 1 August; however, due to "unforeseen delays" it was impossible to submit the C.A.F. Regulations for approval prior to that date, and the term of temporary employment of the advance party was subsequently extended one month to 1 September (P.C. 1797 of 5 August 1920). The officers in the Advance Party, in order of appointment, were: S/L F.G. Pinder, P/O F.A. Pritchard, F/L A.R. Brown, F/L C.D. Fairweather, F/L P.F. Townley, S/L J.S. Williams, F/L H.N. Bethune (medical officer), F/L N.R. Anderson, F/O K.B. Conn, F/L W.H. Miller (medical officer), F/L A.A.L. Cuffe, F/L G.A. Thompson, W/C D.G. Joy, F/L C.F. Falkenberg, F/L O. Berry, F/L M.B. Watson and F/O F.W. Dogherty.

(13) Anderson was a Certificate Examiner in the Air Board from November 1921 after completing his first tour at Camp Borden. Cuffe served continuously at Camp Borden until September 1923 when he was posted to High River.

Borden on 16 August. He completed his training period eleven days later and was then granted leave from the CAF, returning to his Civil Service position in the Air Board. Like W/C Scott, most of the civil servants employed by the Air Board also were appointed to or enlisted in the CAF and donned uniform for the "normal training period" when called up for duty with the CAF. These men, filling the dual role of civil servants under the Air Board and officers or men in the CAF, represented the only permanent thread through the period from late 1919, when the Air Board began to develop, until April 1924, when the permanent RCAF came into being.

While the Advance Party was at work preparing the training centre at Camp Borden, the small headquarters in Ottawa was engaged in preparation of the CAF's constitution. "Unforeseen delays" prolonged the work a month longer than was originally anticipated, but the task was finally completed and on 31 August 1920 "Regulations for the Canadian Air Force" were approved by the Governor in Council. The small volune, whose 200 pages made it seem very slim in comparison with the bulky Queen's Regulations (Air) of thirty years later, was subdivided into nine chapters containing 619 sections. The first five chapters were relatively brief. Chapter 1 (Sections 1-15) dealt with interpretation and application of the regulations. Chapter 2 (Sections 16-56) described the organization of the CAF, while Chapter 3 (Sections 57-104) prescribed command, precedence, duties, honours and salutes; Chapter 4 (Sections 105-157) set forth the rates of pay, allowances and pensions; and Chapter 5 (Sections 158-169) covered matters of kit, equipment, and premises. The remainder of the volume was concerned with discipline. Chapter 6 (Sections 170-560), the longest of all the chapters, constituting more than one-half of the whole book, detailed the disciplinary regulations, while the three final chapters added further regulations for courts of inquiry (Chapter 7, Sections 561-586), evidence (Chapter 8, Sections 587-599), and procedure in cases of desertion (Chapter 9, Sections 600-619). To these chapters were attached three appendices prescribing forms of charges, statement of offences, and forms of commitment, removal and discharge from custody. One would like to think that the impressive amount of detail devoted to offences, courts martial, sentences and such subjects, which comprises three-quarters of the whole volume of regulations, is not to be taken as an indication of the state of discipline anticipated for the new force, but rather as an expression of the legal interest of those who drafted the regulations.

Under the regulations of 1920, "the Command-in-Chief of the Air Force is vested in the King and is exercisable by His Majesty, or by the Governor General as his representative, through the Air Board, which shall be responsible for its administration (Section 17) ..... Subject as aforesaid the command of the air force shall be exercised by the Air Officer Commanding who shall be responsible to the Air Board through the Inspector General (Section 19). The Inspector General of the air force shall ascertain the state of discipline and efficiency in the air force from time to time and report to the Air Board all such matters as in his opinion require to be brought to notice. He shall render to the Governor General such returns as the latter requires relating to the strength and efficiency of the air force or to the air defences" (Section 20).

Administration of the CAF was to be assumed in considerable measure by the Canadian Air Force Association to which a charter had been granted in June 1920. Under the regulations of August 1920 the provincial branch executive committees of the Association were charged with keeping rosters of officers and airmen ordinarily resident in their provinces, selecting them for training or for courts martial, courts of inquiry and other duties, and with taking such action as might be directed for the recruitment, administration and mobilization of the CAF in the provinces (Section 21).(14)

Normally officers and airmen would be posted for duty at a training centre during not more than four weeks in every two years, with at least twelve months between each period of training (Section 49). With their consent, however, personnel could be posted for duty at training centres for periods of up to six months, and could be specially employed on staff duty at air force headquarters or training centres, or on other special duty, for periods of not more than one year; "under special circumstances" these periods could be extended by the Air Board, subject to a report being made to the Governor in Council (Section 50). The total number of officers and airmen so posted for extended duty with pay was not to exceed one-half the number authorized to be employed under the Air Board Act (Section 51).

The ranks prescribed for the Canadian Air Force contained an odd duality reflecting both the new ranks adopted for the Royal Air Force and the old traditional ranks of the Army (and the Royal Flying Corps). The ranks laid down for the CAF were: Air Vice-Marshal or Major-General, Air Commodore or Brigadier-General, Group Captain or Colonel, Wing Commander or Lieutenant-Colonel, Squadron Leader or Major, Flight Lieutenant or Captain, Flying Officer, Pilot Officer; Warrant Officer or Sergeant-Major, Flight Sergeant, Sergeant, Corporal, Air Mechanic (1st Class), and Air Mechanic (1st Class), and Air Mechanic (2nd Class) (Section 66).(15) The peace-time compulsory retirement age for officers began at 30 years for a Pilot Officer, rising by two-year intervals per rank to 46 years for an Air Marshal;(16) exception was made for officers employed on medical or other scientific duties and, for a limited time, for officers required for ground duty only (Section 34). Airmen were enlisted for a period of four years, "but not for any longer period", re-engagements were authorized, however, up to a total continuous period of 21 years' air force service, with the possibility of further extension beyond that term (Sections 37, 40 and 41). Aliens could be

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(14) A detailed constitution for the Association was subsequently issued in CAF Weekly Order Ba. 1.

(15) The duality in ranks above Flying Officer was reflected in service correspondence, officers sometimes using the air force title and sometimes the army designation. In weekly and routine orders only air force ranks were used as a rule, but in normal conversation the more convenient (and familiar) army titles were generally used through the early years. In the case of the Warrant Officer, the title Sergeant-Major was most commonly used both in orders and conversation, and the practice still lingers in the traditional "Major" greeting for a Warrant Officer.

(16) The table of ranks for the C.A.F. stopped at Air Vice-Marshal and did not include Air Marshal.

enlisted in the ranks, provided that their number in any corps or unit did not exceed a ratio of one to every fifty British subjects (Section 47).

The rates of pay for the CAF contained an unusual feature: because of the different periods of service authorized under Sections 49 and 50 it was necessary to lay down three different scales of pay. Most members of the service would be on duty only for "the authorized period of training", i.e. for one month every other year, so the basic daily rates of pay were set at: Air Commodore $9.50, Group Captain $7.50, Wing Commander $6, Squadron Leader $4.75, Flight Lieutenant $4.00, Flying Officer $3.25, Pilot Officer $3.00; Warrant Officer $2.05, Flight-Sergeant $1.80, Sergeant $1.45, Corporal $1.25, Air Mechanic 1st Class $1.15 and Air Machanic 2nd Class $1.00 (Section 109). Officers and airmen on active service or temporarily on duty in peace-time for a period longer than the normal training period, however, received double these rates of pay for a term not longer than one year; if their service extended beyond one year the rate was one and one-half times the basic training pay (Section 110).(17) Because of this curious pay structure, which must have caused complications for the accounting staff, the rate of pay which an officer or airman received was usually indicated after his name when it appeared in weekly orders. Provision was made for the payment of dependents' allowance of $30 to $40 a month when an airman or officer was on duty for longer than a month (Section 148). At places where quarters and rations were not available personnel were entitled to a subsistence allowance of $2.50 or $3.00 per day (Section 152).

In detailing the duties of a commanding officer, the regulations gave high priority to his responsibility that he should, "by advice and timely intervention, endeavor to promote a good understanding and to prevent disputes; discountenance any disposition in his officers to gamble or to extravagance; check any tendency among his officers to practical jokes" (Section 68). Naval tradition inherited from the Royal Naval Air Service was reflected in the detail of compliments and salutes to be observed in air force boats (Section 104).

To clothe the new CAF a uniform was adopted which was cut on a pattern similar to that of the Army. The cloth was dark blue serge with buttons and other insignia of silver metal. Officers' rank was indicated in Army fashion by stars and crowns worn on the shoulder straps, while other ranks carried stripes on their sleeves. Officers of Squadron Leader rank and above wore a row of silver leaves on the peak of their caps. A distinctive Canadian Air Force badge was introduced, consisting

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(17) When a Member of Parliament asked why the pay was reduced after serving a certain length of time, he was told: "The Canadian Air Force is organized as a non-professional force, the personnel of which in all ranks from the lowest to the highest undergoes normally one month's training every two years. Certain staff and administrative duties require for their performance a longer term, normally six to nine months, and to secure the services of competent officers and other instructional personnel for these duties which involve absence by the personnel performing them from their ordinary civil occupations for substantial lengths of time, special rates of pay are provided. These special rates do not apply if the service of any individual is prolonged beyond one year, and the pay receivable is reduced accordingly." Hansard, 1921 Session; Vol. I, p. 965.

of a bronze maple leaf bearing the monogram CAF, flanked by two silver wings and surmounted by the royal crown; on a scroll at the base of the design was the motto SIC ITUR AD ASTRA ("This is the way to the stars"). The badge, produced in several different sizes, was worn by all ranks on their caps, lapels or collars, and was carried on the buttons. The pilot's badge was a bronze maple leaf bearing the monogram CAF, to which were attached two silver wings. There was also an observer's badge consisting of a silver circle with monogrammed maple leaf in the centre and flanked by a single wing. Officers wore a white shirt, with turn-down or wing collar, and carried canes. Both "flat" hats and wedge caps were used by all ranks. Officers of "field" rank, i.e. Squadron Leader and above, could wear riding breeches and field-boots.

When the Regulations had been approved the Advance Party at Camp Borden ceased to exist as such and on 7 September 1920 No. 1 Wing, CAF, was formed there under the command of W/C R.F. Redpath. A fortnight later Redpath returned to headquarters in Ottawa and was succeeded in command of the wing by W/C D.G. Joy who remained until 1 February 1921 when he completed his six-months tour of duty. The Wing was subdivided into a Headquarters and a School of Special Flying, with the personnel of the Advance Party who had not yet completed their tour of duty divided about equally between the two units. On the headquarters staff F/L O. Berry became adjutant, F/Ls H.N. Bethune and W.H. Miller medical officers, and P/O F.A. Pritchard equipment officer. The School of Special Flying was under the command of S/L J.S. Williams with F/Ls N.R. Anderson, A.A.L. Cuffe, C.F. Falkenberg, G.A. Thompson and P.F. Townley and F/O F.W. Dogherty on his staff as instructors. The School was equipped with Avro 504Ks. A Ground Instruction Section was formed with F/L R.A. Logan in charge; it included sections for training in navigation, gunnery, photography, radiotelegraphy, engine repair and aircraft repair. Branches were also set up for equipment, victualling, medical, and camp maintenance, the latter being staffed wholly by civilian employees under Major G.R. Rodgers. The final step in the organization of the Wing was the formation, on 29 September, of No. 1 Squadron under the command of F/L Keith Tailyour. In the School of Special Flying refresher training was given on the Avro, while operational training was given in No. 1 Squadron which had one flight of S.E.5a fighting scouts and one flight of D.H.9a bombers.(18)

With the training centre now organized at Camp Borden the CAF began to function as a non-permanent, non-professional force. Ex-officers of the RAF were granted appointments in the CAF, placed on duty "for the normal training period" and posted to No. 1 Wing; at the end of the one month course the officers were, in most cases, posted to headquarters and granted leave without pay until called up for the next tour of duty. In some cases, however, officers were placed on duty for longer periods, usually three months, with possibly subsequent extensions for specific or indefinite periods. For example, F/L Harold Edwards, who was one of the first group sent to No. 1 Wing,(19)

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(18) During 1920 seventy-three of the gift aircraft were erected and tested at Camp Borden - 43 Avro 504K, 12 S.E.5a, 12 D.H.9a and 6 D.H.4. (Hansard, 1921 Session; Vol. IV, p. 3776.)

(19) Another member of the first group was F/L W.A. Curtis who 27 years later became Chief of the Air Staff.

on the completion of his one-month tour at Camp Borden was posted to headquarters in Ottawa and placed on duty for an indefinite period which continued until the RCAF came into being. By the end of the year 86 officers and 111 airmen had completed the "normal training period"; the total flying was 934 hours, representing an average flying time per pupil of 11.23 hours.(20)

Courses were continued through the winter months as many pilots and mechanics found it more convenient to take their training at that time when there was less commercial work. It was reported that aviation companies and commercial pilots found "the Air Force training a great benefit in providing schools of instruction in all matters relating to flying", and employers co-operated readily with the Air Board in allowing employees leave to take their training. Activities at Camp Borden reached their peak between January and March 1921; thereafter the number of trainees declined appreciably. In all, during 1921, 375 officers and 835 airmen completed short or long courses at the training centre,(21) each pilot receiving an average of 10.03 hours' flying during the month course. The training was conducted, "as far as possible, on the system which obtains in the Royal Air Force." In addition to flying practice, officers were instructed in ground subjects, the syllabus including navigation, photography, wireless telegraphy, armament, rigging and engines; airmen received training in their respective trades.(22)

In addition to the refresher training (2620 hours) and some communication flying (227.45 hours) at Camp Borden during 1921, the CAF also engaged in several co-operation exercises with the other services for a total of about 139 hours. At Petawawa, two aircraft detached from Camp Borden made flights of about an hour's average duration to "spot" for artillery batteries carrying out their annual summer practice, to take part in various tactical exercises with cavalry units at the camp, and also to give artillery and cavalry officers lessons in observing from the air. In September two aircraft were again sent from Camp Borden to Kingston for a "staff tour" under the direction of the GOC M.D.3. Demonstrations were given in the use of aircraft as a means of gaining intelligence and securing tactical cohesion, and army officers were given instructional flights over the manoeuvre area. Likewise, for the benefit of the troops at Sarcee Camp in western Canada, an aircraft from High River made one long flight of almost four hours' duration to assist in the artillery practice. At the request of the Department of Militia and Defence the CAF also made an aerial survey of Petawawa Camp and its environs; the prints were subsequently assembled as a mosaic

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(20) Air Board Report for 1921, p. 20. There were two types of courses - short (one month) and long (three months). Details were:
Officers' Short Course - Flying 73; Ground 3
Officers' Long Course - Flying 6; Ground 4
Airmen's Short Course - 88; Airmen's Long Course 23.

(21) Officers' Short Course (Flying) 292
Officers' Long Course (Flying) 20
Officers' Short Course (Ground) 50
Officers' Long Course (Ground) 13
Airmen's Short Course 670
Airmen's Long Course 165

(22) "Special facilities are provided for those who make civil aviation their profession". Air Board Report, 1921; p. 12.

for the use of the Army.

All this training, Army co-operation, communication and photographic work was carried out on landplanes. Practice in the service use of flying-boats was gained during an "interesting and instructive" week-long exercise carried out with the Royal Canadian Navy at Halifax late in August. A special detachment of the CAF was mobilized at Baker's Point, on the northeast side of the harbour, the personnel present including A/V/M Gwatkin, the Inspector-General, and W/Cs Leckie and Scott. During the exercise the detachment made eleven flights, averaging about two hours each. On one flight a flying-boat patrolled from Chebucto Head to the outer automatic buoy, reporting by signal to HMCS. "Aurora", the Naval Dockyard, and the base at Baker's Point. The next day aircraft reconnoitred the harbour, observing the movement of ships between Camperdown and Devil's Island, and sending and receiving numerous messages by both Aldis lamp and wireless. At the end of the exercise a patrol flew 50 miles out to sea to meet the fleet and escort it to Halifax, all the while maintaining wireless telephonic communication with the base, to which messages were also transported by carrier pigeons released at sea.

Wireless communication was also developed over land when the Royal Canadian Corps of Signals in November 1921 established wireless telegraph communication between Camp Borden and Ottawa for the CAF, "resulting in considerable saving in telegraph and telephone expenses, as well as being the means of speeding up the administrative work between the Canadian Air Force Headquarters and Camp Borden, and in addition, providing the practical work so necessary to keep the wireless personnel in an efficient state." To further improve the service the Air Board requested estimates for radio telephone communication between the two bases.(23)

The provisional establishment authorized for the CAF, it will be recalled, was 1340 officers and 3905 airmen. By the end of 1921 the officers' quota had been almost filled with 1281 names on the roll, but the airmen fell far short of their ceiling as only 1350 had sent in applications for enlistment. Of this total strength of 2631, 505 officers and 1166 airmen had completed "tours of duty" by the close of the year. The non-permanent, non-professional character of the force inevitably meant that there were numerous changes in the administrative and training staffs. At CAF Headquarters in Ottawa, where the staff numbered only five officers and four airmen, there were three changes of commanding officer during 1921. A/C Tylee completed his nine-months tour on 1 March 1921 and, after a three-weeks "interregnum", was succeeded by W/C R.F. Redpath on 22 March.(24) Four months later, on 12 July, Redpath relinquished command of the CAF to W/C J. Stanley Scott, who retained that post (as well as his position as Controller of Civil Aviation) until the end of June 1922. Other "permanent" members of the headquarters staff were

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(23) Report of the Department of Militia and Defence for the fiscal year ending 31 March 1922; p. 16.

(24) After a period as C.O. of No. 1 Wing at Camp Borden, W/C Redpath had gone to the United Kingdom on special duty in November 1920 to study the latest training methods of the RAF and to gain information about the supply of aircraft to the CAF. He returned to Canada at the beginning of March 1921.

S/L F.G. Pinder (from 31 August 1920 to 30 September 1922), F/L H. Edwards (from 15 October 1920 to 12 August 1923), and F/L G.J. Blackmore (from 21 June 1920 to 30 June 1922).

In the "School of Aviation" at Camp Borden, which had a much larger staff of 49 officers and 235 airmen, there were several changes in command and organization. On completion of his six-months' tour of duty W/C D.G. Joy relinquished command of No. 1 Wing, on 1 February 1921, and was succeeded by W/C J. Scott Williams. The latters' position as O.C. the School of Special Flying was then taken over by S/L Keith Tailyour who in turn handed over No. 1 Squadron to S/L G.A. Thompson. This organization of Wing, SSF, and Squadron continued until 1 April 1921 when the School and Squadron were washed out and the Wing was subdivided into three flights, A, B and C under the command of S/L Tailyour, F/L N.R. Anderson and F/L A.A.L. Cuffe. W/C Williams completed a year on duty with the CAF on 5 July 1921 and relinquished command of the Wing to S/L J.L. Gordon, who also held a civil appointment under the Air Board as an Assistant Director of Flying Operations on W/C Leckie's staff. Apparently simultaneously with the change of command, the title of the training centre was changed to No. 1 Squadron. A few months later, on October 1921, the designation was changed again to Training Depot Station which continued in use until the beginning of 1924. W/C Gordon commanded the Squadron and T.D.S. until 29 December 1921 when he returned to his civil duties. The station was then taken over by S/L J.A. Glen, a Canadian officer in the RAF who was seconded for duty under the Air Board and, like Gordon, held a civil appointment as Assistant Director of Flying Operations.

A few days after the flight organization was instituted at Camp Borden, S/L Keith Tailyour, the officer in charge of "A" Flight, lost his life in a flying accident. On the afternoon of 11 April Tailyour took an Avro up for a test flight during which he engaged in some aerobatics at a low height; one loop was attempted so close to the ground that the pilot failed to level out in time, and crashed on the airfield in a vertical dive. There is an old superstition that accidents come in threes. Tailyour's death was the third fatality at the camp in less than a fortnight. On 29 March F/L D.M.B. Galbraith was killed in a motor car accident on the Angus road. A week later F/O J.A. LeRoyer died as the result of injuries received in the crash of an Avro four days previously. An Air Certificate Examiner in the Air Board, LeRoyer was undergoing his "normal training period" as a CAF officer at the time of the accident.(25)

Following the death of S/L Tailyour the number of flights was reduced to two, and F/L N.R. Anderson was appointed O.C. flying instruction with F/Ls J.H. Tudhope and A.A.L. Cuffe as flight commanders. In September when Anderson returned to his civil appointment as Certificate Examiner, Cuffe succeeded him in charge of flying instruction and F/Ls R.S. Grandy and G.G. Wakeman became the flight commanders. At the same time Tudhope returned to his civil post at the Air Board station at High River. Through all these vicissitudes of titles and officers, the Ground Instruction School continued to operate under F/L Logan. Major (S/L) E.F. Nivin was senior medical officer.

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(25) An airman clerk, 2/AM Bernard Rice, who died in hospital at Hamilton, Ont., on 4 February 1921, was the first casualty in the C.A.F.

Early in 1921 the establishment at Camp Borden was increased by the appointment of a Chaplain to the CAF. In the earlier period religious administration had frequently been provided by visiting clergymen, with rather amusing results on one occasion. Shortly after the camp opened for training the commanding officer received a telegram "Arriving Angus Saturday. Arrange parade Sunday". The signature on the telegram was GWATKIN. Believing that the Inspector-General was coming, on rather short notice, to inspect the station, the C.O. hurriedly prepared to put on a good show and at the appointed time a party of officers assembled on the station platform to receive the Air Vice-Marshal. Several passengers alighted, but the Inspector-General was not among them. Somewhat concerned, the officers were discussing what they should do when they noticed an elderly clergyman approach their group. "Are you gentlemen from Camp Borden? I am the Reverend G. Watkin and I've come to conduct a church service there tomorrow." With the appointment of Hon. Capt. the Rev. J.F. Tupper as Chaplain, with the "relative rank" of flight lieutenant on 5 February 1921, regular religious ministration at the camp was provided for almost two years. Capt. Tupper filled the position of Chaplain until the beginning of December 1922. Thereafter church services were conducted by local clergymen, or visiting ministers from Toronto, until Army chaplains took over the duty in 1924.(26)

In its recommendations for the formation of the Canadian Air Force the Air Board had proposed that "war formations should exist only upon paper and not in the form of embodied units", and one of the duties assigned to the provincial branches of the CAF Association was "to maintain lists of the personnel belonging to each of the squadrons ..... authorized to be formed....." The first of these "paper war formations" were organized on 14 November 1921 when Nos. 1 and 2 Squadrons, Ontario (Inactive Units) were formed under the command of S/Ls H.A. Wood and B.S. Wemp. They each had, initially, a strength of 25 or 26 officers and 72 to 82 airmen who were distributed between headquarters and three flights; an attempt was apparently made to maintain a proper balance of trades required for operation upon mobilization. Subsequently six more inactive squadrons were formed: No. 4 Squadron, Quebec (F/L W.J. Rutherford) on 1 December 1921; No. 13 Squadron, Alberta (S/L G.H. Turnbull) on 10 December 1921; No. 6 Squadron, Maritime Provinces (F/L J.L.M. White) on 31 March 1922; No. 10 Squadron, Manitoba (F/L J.H. Cathcart) on 31 March 1922; No. 11 Squadron, British Columbia (S/L L.S. Metford) on 31 March 1922; and No. 12 Squadron, Saskatchewan (F/L R.A. Delhaye) on 29 April 1922.(27) Thereafter, officers and airmen upon completion of the "normal training period" at Camp Borden were granted leave without pay and posted either to an inactive squadron or the unattached list of their province of residence.

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(26) There were no R.C.A.F. Chaplains until the appointment of the Right Rev. R.J. Renison as Chaplain of No. 110 Squadron of the Auxiliary on 1 July 1938.

(27) Nos. 6, 10, 11 and 12 Squadrons were initially authorized to form on 10 December 1921 (see C.A.F. Weekly Orders Ab 5, 6, 8 and 9), but they did not actually organize until the dates given above. It was apparently intended to form thirteen inactive squadrons (see Air Board Report, 1921; p. 11), but there is no record of Nos. 5, 7, 8 or 9 Squadrons being organized. No. 3 Squadron, Ontario, was to form on 23 January 1922 (C.A.F. Weekly Order Ab 3/1), but records do not show that any personnel were posted to it.

To facilitate the keeping of records, an abbreviation indicating the province was included in orders after the individual's name. The eight inactive units of the CAF remained in existence, on paper, until 31 March 1924 when they were disbanded.(28)

Through these inactive paper units the CAF was "capable of expansion in case of emergency", but at other times its functions were, as its planners had emphasized, "almost exclusively instructional". In referring to the work of the CAF in 1921, the annual Air Board report remarked: "All of the officers in the Canadian Air Force, and a proportion of the airmen, served during the war in the Royal Air Force. Therefore the standard of efficiency is high, and esprit de corps is very strong; but the time is approaching when fresh blood should be infused."(29) Some of the problems inherent in a non-permanent, non-professional service were discussed at a meeting of the CAF Association provincial branch executives which was convened at Camp Borden on 21 June 1921. The recruiting of suitable men for the ranks was a major problem. The Flying Operations Branch of the Air Board had been organized before the CAF and consequently had had the pick of the men with practical experience as mechanics in the RAF. Although all these men were also enlisted in the CAF and did their "normal training period" of one month at Camp Borden, the other men recruited for the CAF were, in general, less experienced. W/C Williams, the officer commanding at Camp Borden, pointed out that of the recruits who had passed through the training centre, only some 12% had previous service in the RAF; to convert a skilled workman into an efficient air mechanic required three to six months training. Other delegates commented that too many men applied for enlistment because they were out of work;(30) that too much of the instruction was on old-fashioned machines, the latest types not being available; and that good men after completing their training got work elsewhere and were lost to the CAF. Better pay and permanent jobs were necessary if the right men were to be secured. Quality was required rather than numbers.

The conference also considered the matter of "fresh blood". It would be necessary to replace the present flying personnel before long. To obtain officers, it was suggested that university students might be taught the theory of aviation as part of their engineering course and that they might receive practical training at a CAF camp during summer vacation.(31) To obtain air mechanics, a school might be established for the training of boys, similar to the practice followed by the Navy. Another delegate recommended encouraging Boy Scouts and school Cadets to take an interest in flying.

W/C Joy, one of the Ontario delegates, suggested that His Majesty the King be asked to permit use of the title "Royal" for the CAF, to which the Inspector-General replied that he would act upon the suggestion.

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(28) Weekly Order 31/24, dated 12 April 1924.
(29) Air Board Report, 1921; p. 11.
(30) It was reported that some men enlisted in western Canada simply to get transportation to the east. Deserters were numerous, but it was inexpedient to take drastic action against them.
(31) This was essentially the scheme adopted two years later.

Underlying most of the discussion at the conference was the recurrent theme that a permanent staff, permanent instructors, permanent careers were needed. Some delegates recommended that the civil and military branches of the Air Board, the Directorate of Flying Operations and the CAF, should be combined, although the Inspector-General suggested that it was not wise at present to dwell on the importance of military aviation.(32)

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(32) Report of Conference, 21 June 1921.

B. C.A.F. Ensign

In February 1921 when a description of the new Royal Air Force ensign was received in Canada,(33) Air Vice-Marshal Gwatkin suggested that it might be appropriate to secure the use of a suitable ensign for the CAF. Air Commodore Tylee, the AOC, proposed adoption of the RAF ensign "with the addition say of a maple leaf in the inner circle." The matter was discussed at a departmental committee meeting and left with the Inspector-General for consideration and action. Sir Willoughby subsequently wrote to Air Marshal Sir Hugh Trenchard, the Chief of the Air Staff, on 20 May 1921, to ask his unofficial feeling whether the RAF would permit the Air Board to use its ensign as the basis for two flags for the CAF and the Flying Operations Branch. For the CAF Gwatkin proposed "a maple leaf red on two roundels superimposed, white upon blue", and for the Flying Operations the same ensign without a device in the fly. Trenchard heartily agreed with the proposal, but suggested that "to retain the sentiment of unity between the Air Services of the Empire" it would be preferable to keep the roundels intact. Gwatkin concurred: "The CAF would like to use, without any 'difference', the same ensign as the RAF"; and Sir Hugh asked that the proposal be raised by a formal despatch.

With the approval of the Minister of Militia and Defence, Mr. Guthrie, who was Chairman of the Air Board, the Secretary on 3 September 1921 made formal application through the Under-Secretary of State for External Affairs. Despatch 758 of 22 October from Winston S. Churchill, the Secretary of State for the Colonies, to Lord Byng, the Governor-General of Canada, brought the reply: "the Air Council are most happy to accede to the request that the Canadian Air Force be granted permission to use, without 'difference', the ensign of the Royal Air Force". In acknowledging receipt of the despatch, the Secretary of the Air Board wrote that "the right thereby conferred, the Canadian Air Force will ever regard as an honour and a privilege", and Gwatkin wrote to Trenchard to thank him, in the name of the CAF, for having obtained the great honour.

In reporting to the departmental committee that approval had been granted for use of the RAF ensign, the Inspector-General proposed that the CAF also adopt the custom of saluting the flag when it was hoisted and lowered each day, as was done in the RAF. An ensign was then requisitioned, instructions sent to the commanding officer at Camp Borden to erect a mast and gaff,(34) and arrangements were made to have a ceremonial hoisting of the ensign on 30 November. Air Vice-Marshal Gwatkin was anxious to have the ceremony "made as pompous as possible", but an impending federal election made it impossible for the minister to attend,

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(33) The heraldic description was light blue, in the dexter canton the Union, and, in the centre of the fly of the flag, three roundels superimposed red upon white upon blue. This section is based upon AFHQ file 601-4B-8, volume 1.

(34) The departmental committee agreed to adopt a naval mast, as was used by the RAF, with the ensign flown from the gaff and the commanding officer's flag from the masthead. Over Air Board officers, however, the flag to be flown would be the Union, not the CAF ensign, as the department was civil in character.

and the military dignitaries who were invited sent their regrets. So it was a family affair for the officers and airmen of the CAF with their colleagues from the Flying Operations and Civil Aviation branches of the Air Board.

At 1430 hours on 30 November, 45 officers and 169 airmen paraded before the headquarters building at Camp Borden. Among those present were Air Vice-Marshal Gwatkin, W/C J.S. Scott, CO of the CAF, W/C J.L. Gordon, OC of the Training Depot Station, W/C R. Leckie, the Director of Flying Operations, S/L L.S. Breadner and F/L G.O. Johnson from the Civil Aviation branch, and Mr. J.A. Wilson, Secretary of the Air Board. A telegram from the Governor-General, Lord Byng of Vimy, brought "congratulations on your inaugural ceremony." The ensign was carried to the centre of the parade square by FS Duncan Black who handed it over to F/O K.A. Creery. The chaplain, Rev. J.F. Tupper, said a few prayers and consecrated the ensign which was then handed to S/L G.M. Croil for presentation to the Inspector-General. After W/C Scott had in turn accepted the ensign it was returned to F/O Creery who had the honour of hoisting it to the gaff for the first time while the parade saluted. In a brief address the Inspector-General told the parade: "From today we are entitled to fly the light blue ensign of the Royal Air Force. It was Air Marshal Sir Hugh Trenchard who obtained for us that privilege. I will tell him of the ceremony in which we have taken part this afternoon. I will tell him how proud you are of your flag: that you know what it stands for: that you will be true to its traditions." As the parade marched away, Avros circled overhead, dipping in salute to the ensign.(35)

The ceremony in which the light blue ensign was hoisted for the first time in Canada was "quite simple", but "dignified and impressive"; the weather was fine and "all looked their very best." In a letter to Sir Willoughby Gwatkin, written on the day of the ceremony, Sir Hugh Trenchard paid his tribute:

> "I shall never forget the good work that Canadian Pilots and Observers carried out under me in France, and I am very glad to think that they and their successors use the Royal Air Force ensign, the underlying idea of which is the target used to mark all British machines in France, and in connection with which so many gallant airmen fought their last fight."

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The original proposal, it will be recalled, was to have two flags, one for the CAF and the other for the Flying Operations Branch. For the latter it was first suggested that the RAF ensign be used without a device in the fly. Gwatkin later suggested that Flying Operations might use three green maple leaves, stalked, on a white disc in lieu of the roundels, and several sketch designs were then prepared. Ultimately, on 25 November 1921, a design was approved for an ensign in which the roundels were replaced by a red shield, edged in white, on which

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(35) Also present for the occasion was a bear cub which F/L Kenny had brought back from his summer operations at Roberval. The pet remained on the station for some time, even invading the officers' bedrooms to their consternation and detriment to their clothing, until it grew too large for safety.

were displayed a white bird(36) and three maple leaves conjoined on one stem, proper.(37) The flag for the civil Flying Operations Branch was never flown, however; the consolidation of that branch with the CAF, which was effected in 1922, made the ensign unnecessary as the CAF ensign was then flown at all stations.(38)

C.A.F. Ensign

"Wednesday, November 30th, 1921, will long be remembered as the date on which the flag which the Canadian Air Force has been authorized to use was unfurled at Camp Borden. The ceremonial parade was carried out with the usual pomp and splendour."

"The Borden Flyer", Vol. 1, No. 13; Nov. 30/21.

(copy held by A/V/M Walsh)

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(36) Following the old RNAS tradition, W/C Leckie, the Director of Flying Operations, called the bird an albatross.
(37) The maple leaves were the same as those used in the new Arms of Canada. A description of the civil flag was published in The Canada Gazette, 7 January 1922; p. 2706, and the CAF ensign on 14 January 1922; p. 2760.
(38) See Departmental Committee meeting 270 on 7 June 1922. It was suggested that the civil flag could be used by civil air companies.

Canadian Air Force Association

Public Notice is hereby given that under the First Part of chapter 79 of the Revised Statutes of Canada, 1906 known as "The Companies Act," and amending Acts, letters patent have been issued under the Seal of the Secretary of State of Canada, bearing date the 8th day of June, 1920, incorporating the Honourable Hugh Guthrie, a member of His Majesty's Privy Council and one of His Majesty's counsel, Oliver Mowat Biggar, vice-chairman of the Air Board and one of His Majesty's counsel, Sir Willoughby Gwatkin, KCMG, CB, Major General, Robert Leckie, DSO, Lieutenant-Colonel, Superintendent of Flying Operations, James Stanley Scott, MC, Lieutenant-Colonel, Superintendent of Certificate Branch, and Edouard Deville, LL.D., DTS, Surveyor General, all of the City of Ottawa, in the Province of Ontario, for the following purposes, viz:-

To promote the efficiency and advance the interests of the Canadian Air Force and to assume such share of the administration of such force, constituted under the provisions of the Air Board Act, 9-10 George V, c. 11, as may be authorized by the Governor in Council.

The operations of the corporation to be carried on without share capital throughout the Dominion of Canada and elsewhere by the name of "Canadian Air Force Association," and the chief office of the said corporation to be at the City of Ottawa, in the Province of Ontario.

Dated at the office of the Secretary of State of Canada, this 16th day of June, 1920.

THOMAS MULVEY,
Under-Secretary of State.

The Canada Gazette, Vol. LIII, No. 51, (June 19, 1920); page 4465

C. Constitution of the Canadian Air Force Association

(1) The Branches of the Canadian Air Force Association shall consist of all the commissioned officers ordinarily resident in the several provinces.

(2) The Lieut.-Governors of each Province shall be the Honorary President of that Branch.

(2a) The Lieut.-Governors of Nova Scotia, New Brunswick, and Prince Edward Island shall be the Honorary Presidents of the Maritime Branch.

(3) Each Branch shall be managed by an Executive Committee consisting of seven members, of whom four shall be officers on the active list of the Canadian Air Force ordinarily resident in the Province, and who shall hold office for two years and shall serve without remuneration. The Committee shall select annually a Chairman and a Vice-Chairman from among its members, and shall appoint a Secretary who shall not be a member of the Committee and who may be remunerated for his services.

(4) No fee shall be payable for membership in the Branch.

(5) The first members of the Executive Committee shall be selected by the Honorary President and shall hold office until the 31st of March, 1921.

(6) It shall be the duty of the Secretary between the 1st and 5th days of February, 1921, and every two years thereafter, to send by mail to every member of the Branch a list in order of seniority of the officers on the active list of the Canadian Air Force who are ordinarily resident in the Province, together with a voting paper upon which each member of the Branch may record his vote for the four members of the Executive Committee who are to be selected from among the officers named in such list. The retiring members of the Executive Committee shall not be specially indicated in such list, and there shall not be sent therewith any statement or list naming such retiring members.

(7) On the second Monday in March following the Secretary shall open the voting papers at a time and place fixed by the Executive Committee and in the presence of such members of the Committee as may then attend, and shall certify the four officers who have received the largest number of votes as having been elected to the Executive Committee for the two years beginning on the 1st of April next following.

(8) The other three members of the Executive Committee shall be named by the Honorary President.

(9) Four members of the Executive Committee shall constitute a quorum, and the Committee shall regulate its own procedure.

(10) The Secretary of the Executive Committee may, with the approval of the Executive Committee, act as secretary of other associations organized for the purpose of promoting aeronautics, but there shall be no discrimination in the administration of the Branch between members thereof who do and who do not belong to any of such other associations.

(11) It shall be the duty of the Executive Committee, and of the Secretary under its direction:--

(a) To keep a roster of all the officers and airmen of the Canadian Air Force ordinarily resident in the Province.

(b) If required to maintain lists of the personnel belonging to each of the squadrons or other units of the Force authorized to be formed in the province, and to insure that every such squadron or other unit is kept up to establishment, and that each individual belonging thereto is familiar with his duty upon mobilization.

(c) To select, in such numbers in each rank as the Air Board may direct, the officers and airmen who are to report for

training at the prescribed dates and training centres, to select alternates when necessary to supply vacancies, and to issue the necessary directions or orders for the attendance of the officers and airmen so selected.

(d) To select officers to constitute Boards of Enquiry in cases of accidents or alleged breach of regulations when such Boards are authorized by the Air Board.

(e) To make all necessary suggestions and to take such action as may be required in accordance with regulations for the recruitment and administration of the CAF in the Province, and

(f) Generally to advance the interests of the Canadian Air Force.

(12) Any grant in aid of the branch of the Association made by the Air Board out of any sums provided by Parliament shall be expended under the direction of the Executive Committee.

From CAF Weekly Order Ba.1

Chapter III

A. Flying Operations (1920)

In November 1919 Lt Col Leckie was appointed Superintendent of Flying Operations in the Air Board. Following the Inter-departmental Conference held in January 1920 plans were drafted for various air operations to be carried out during the year. As some departments were disinterested or sceptical of the use of aircraft in their work these initial plans were on a quite limited scale. It was proposed to open four air stations, one at Vancouver for forestry and fishery patrols in conjunction with the British Columbia government, one at Morley for forest patrol in Alberta, another at Roberval for forest survey in conjunction with the Quebec government, and one at Ottawa for experiments in aerial photography. No funds were available for these operations until the Air Board estimates were passed at the end of June, appropriating $1,100,000 for civil aviation. Directly the funds were voted, work was hastened in order to accomplish as much as possible of the program in the four or five months before winter would suspend activities.

Personnel had been recruited by the Civil Service Commission for the staff at headquarters and at the stations--air station superintendents, air pilot navigators, fitters, riggers, store-keepers, drivers and clerks. For equipment there were available the aircraft, vehicles, hangars and stores donated by the British and American governments, and two air stations were in existence on the Atlantic coast.

As there was no need to maintain both the stations in Nova Scotia, the site at North Sydney was closed, the aircraft and other equipment being transferred to Dartmouth while the buildings and surplus material were offered for sale by auction. The site at Dartmouth, under Major A.B. Shearer as air station super-intendent, was retained for the erection and repair of seaplanes used by the Operations Branch, and for combined training by the CAF with the Naval Service and the local garrison. As the station could be kept open throughout the year, with air routes suitable for seaplanes leading to all parts of eastern and central Canada, Dartmouth was regarded as an ideal location. Aircraft required for operations could be flown as far west as Winnipeg in the spring and then in the fall, before ice formed on the lakes and rivers, they could be flown back to base for overhaul and repair during the winter.(1)

The first operation undertaken by aircraft detached from Dartmouth was an experiment in forest patrol and survey, under-taken at the request of the Quebec government, to show the value of aircraft for such work and to facilitate the exploration of forest areas north and west of Lake St. John. Through the courtesy of Lt. Col. B.A. Scott, a suitable site was provided on the shore of the lake at Roberval where the province erected buildings and a slipway. Two HS2L flying-boats were then flown in from Halifax, arriving at Roberval on 19 July, and "flying

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(1) Construction costs at Dartmouth during the year were $157.90 and operational costs $49,248.67. See Hansard, 1921 Session; Vol. IV, p. 3902. The station was located at Baker's Point on the northeast side of Halifax harbour.

continued uninterruptedly until the end of October when winter put an end to the work for the season." The station was in charge of F/L W.R. Kenny, and the provincial Department of Lands and Forests directed the work, its forestry officers showing the keenest interest in the experiment and insuring its success by their full co-operation. Reconnaissance flights were made, caches established to permit patrols being pushed farther afield in future, and photographic surveys were flown over the main river courses in the district. The total flying time on these operations was 73 hours.(2) At the end of the season the provincial authorities expressed full satisfaction with the experiment and asked that it be continued in 1921 and extended to Lake Mistassini and, if possible, to the shores of James Bay; they were prepared "to increase their expenditure on the work considerably."

A similar experiment in forest survey was carried out in northern Ontario during the early autumn of 1920 at the request of the Entomological Branch of the Department of Agriculture and the Conservation Commission who sought the Air Board's co-operation in an operation to determine the use of aircraft for the survey of forest areas affected by the spruce bud worm pest. In September Capt. C. McEwen and a mechanic flew an HS2L from Ottawa to Haileybury where a mooring-out station was established on Lake Timiskaming. Operations continued from the temporary base for a fortnight during which time a complete survey was made of forest conditions over a large territory. The Forestry and Entomological officers engaged in the work said that the 18 hours of flying enabled them to gain more information than they could have obtained in several months of work on the ground.

In western Canada two air stations were opened in 1920 for similar operations in British Columbia and Alberta. Authority for a station at Vancouver was given by the Air Board on 14 February and confirmed three months later.(3) Major C. MacLaurin, who had been designated air station superintendent, selected a suitable site for a seaplane station at Jericho Beach on part of the old Naval Reserve on English Bay and construction of facilities began in June. The province provided the site free of charge and agreed also to defray a substantial part of the cost of operations which were to include forest protection and survey, transportation to inaccessible districts, photographic survey and fishery patrol on behalf of both the federal and provincial governments. Temporary Bessonneau hangars were erected, pending construction of permanent buildings, and the ground work was sufficiently advanced by the end of August to permit erection of the first HS2L.(4) Major MacLaurin made the first test flight on 24 September, followed by further experimental flights during the next few weeks "to gain familiarity with conditions and test thoroughly the suitability of the equipment". One experimental flight was made to Victoria in an attempt to interest Premier Oliver in the proposed seaplane service as he had

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(2) The cost of the Roberval experiment was $17,344.34. See Hansard, 1921 Session; Vol. IV, p. 3902.
(3) P.C. 435 of 15 May 1920.
(4) The site was selected by MacLaurin on 29 May; by 15 September a concrete apron (300 by 75 ft.) and a slipway (210 by 25 ft.) had been completed.

previously criticised expenditure by the federal government for forestry patrol.

Late in September, Major MacLaurin undertook the first operation to fly a Dominion entomologist to Slave River so that he could inspect and photograph from the air swamp lands where the mosquito pest was believed to originate. A month later the HS2L was dismantled and shipped to a siding near Sicamous (Carney's) where it was reassembled for a series of flights from Shuswap Lake as far west as Kamloops. On these flights MacLaurin was accompanied by a forestry officer (Mr. R. Cameron), as well as his photographer (C.J. Duncan) and mechanic (A.L. Hartridge). On completion of the operation, on 15 November, the flying-boat was again dismantled at Carney's for shipment to Vancouver. In the last days of the year the HS2L was flown across to Victoria, Esquimalt and Sooke for coastal defence reconnaissance. Officers of the Dominion and provincial departments who gave "their heartiest co-operation" to the demonstrations from Jericho Beach "expressed themselves fully satisfied that the use of aircraft will increase the efficiency of their services and render possible much work which cannot be undertaken to advantage at present."(5)

Another demonstration at Vancouver was less successful. The station diary records that on 20 October A/C Tylee, Lt. Col. Leckie, Major Hobbs and Capt. Thompson, all of whom had taken part in the trans-Canada flight, took off from Vancouver to fly to Victoria. After two and a half hours in the air the flying-boat forced-landed in the fog at Port Townsend, Wash, on Puget Sound, some 35 miles south-east of its destination. An hour later the party set out again, intending to fly due west to Port Angeles, a point almost directly across from the strait from Victoria, but once again they had to put down at Friday Harbour, short of their objective. Unable to get the engine started again that day, the officers lay over until the morning of the 21st when a half-hour flight brought them safely, if by a somewhat circuitous route, to their original destination. The report in the diary ends with the comment that Major MacLaurin travelled to Victoria by boat and flew his HS2L back to Vancouver that afternoon.

In addition to forest survey by flying-boats operating from Roberval, Haileybury and Jericho Beach, the Air Board also opened in 1920 a station in south-western Alberta for forest patrol by landplanes. Concerned over the great havoc caused by forest fires in the Dominion forest reserve stretching along the eastern slopes of the Rocky Mountains from the international boundary north to Yellowhead Pass, the Forestry Branch of the Department of the Interior was anxious to learn if better control of the situation could be exercised from the air. An aerodrome site was selected on the Indian reserve at Morley in the Bow valley, west of Calgary, and a Bessonneau hangar was erected in August to accommodate several de Havilland and Avro aircraft shipped from the east. Major G.M. Croil was appointed air station superintendent. Through September and October patrols were flown with excellent results, using both types of aircraft; the DH4 proved to be very valuable for this work,

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(5) Air Board Report for 1920; p. 8.

due to its high speed and reserve power, "as strong winds are very prevalent and less powerful machines cannot make headway against them." Through the co-operation of the Radio-telegraph Branch of the Department of the Naval Service wireless communication was established between the base at Morley and the aircraft out on patrol. The season of the greatest fire hazard had passed before operations began; nevertheless during the few weeks that patrols were flown, many fires were detected and full information about their location, extent and progress was given to the forestry officers. Fully satisfied with the results of the first season's brief experience, these officers asked that the service be extended in 1921 and the Operations Branch agreed, subject to provision of the necessary funds, to establish two patrol areas based on High River and Eckville.(6) At the time the Air Board began operations in Alberta the Dominion Forestry Branch was just completing a ground organization for protection of the forests. Had it not been for the use of aircraft, the Branch would have been forced to make "heavy capital expenditures on the installation of an elaborate lookout system, involving not only large construction projects but additional personnel obligations and consequent permanently increased overhead costs." The air patrols "proved so satisfactory and so well qualified in every way to meet the needs of the Alberta forests that the lookout system was abandoned."(7)

The sixth station opened by the Air Board in 1920 was a small experimental base at Ottawa. Through arrangement with the Department of Militia and Defence the use was obtained of a tract of vacant land in the danger area behind the butts of the Rockcliffe Rifle range. Discounting the risk of a possible stray shot, the site was suitable for landplanes and had the additional advantage that the adjacent Ottawa river provided perfect facilities for seaplanes and flying-boats. Until Trenton was developed a decade later, Rockcliffe was the only combined land-and-water base in the service. Temporary Bessonneau hangars provided accommodation for a varied collection of aircraft types.

Most of the work done at Rockcliffe in the first year was in connection with aerial photography and survey. The marked advances in aerial photography during the war had aroused much interest among surveyors, particularly in Canada where photo-topographic methods of surveying had been greatly developed; it was believed that the perfection of aerial photography would lead to still further progress in that field. In 1919 an aerial survey committee of representatives from the various surveying branches of the federal government was formed to study the subject, and the co-operation of the Air Board was requested in a practical experiment. It was decided that Ottawa would be the most favourable location for the initial tests as the surrounding terrain was varied and provided, within a small district, areas of both land and water with varying elevations. Dr. Deville, chairman of the Aerial Survey Committee who, as Surveyor General, was also a member of the Air Board, supervised the experiments while the field work and actual operations were

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(6) Construction costs at Morley during 1920 were only $1,000; the operations costs $45,840.48. See Hansard, 1921 Session; Vol. IV, p. 3902.
(7) Air Board Report for 1922; p. 73.

carried out by Mr. F.H. Lambart, DLS, an officer with long experience in photo-topography.

Both an Avro 504K and a Bristol F2B Fighter were used in the experiments[8] which demonstrated that the two major problems were, first to obtain a stabilized camera, and then to rectify the photographs so that topographical detail could be placed accurately on the maps. A report was published describing the experiment which "created much interest in engineering circles."[9]

In addition to experimental photography the air station at Ottawa carried out a few minor operations and some communication and demonstration work. Flying was continued until the middle of November when activities ceased for the winter; the total flying time for the 1920 season was 91.30 hours "on many types of land and water machines."

In its first brief season the Operations Branch under Lt-Col Leckie had made a good start; five stations had been opened at Dartmouth, Roberval, Rockcliffe, Morley and Vancouver, as well as a temporary site at Haileybury, and 398 flights had been made for a total of 480.10 hours (or approximately 33,612 miles) to demonstrate the utility of aircraft, particularly in the field of forest patrol and survey.[10]

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(8) The Avro (130 h.p. Clerget engine) was too light for the work; the Bristol (270 h.p. Rolls Royce Falcon III) was a good photographic machine except for its sensitivity on the controls which placed considerable strain on the pilot in maintaining straight and level flight. A D.H.4 or D.H.9a, or a Vickers Vimy commercial type, would be nearer the aircraft required for this special work. The camera used in the experiments was an R.A.F. war-time type, the LB (MK.1) semi-automatic, manufactured by Williamson Kinematograph Co; London, England, using a 4x5 inch plate, with a focal length of 8½ inches. Photographs were taken at 5,000 and 10,000 feet altitude.

(9) Report on Experimental Aerial Survey at Ottawa 1920; Air Board Bulletin No. 2; Ottawa, March 1921; pp. 16 with three plates of maps.

(10) The Operations Branch also had a staff at Camp Borden to erect and test the gift aircraft stored there, and to operate the engine and aircraft repair shops. This work was transferred to the Technical Branch at the end of the year.

B. Secretariat

Under the Secretary (Major A.M. Shook from November 1919 and then Mr. J.A. Wilson from April 1920) there was built up a departmental organization to minister to the common requirements of the other branches- Flying Operations, Civil Aviation and CAF. This organization included accounts, equipment, medical, intelligence, technical and records branches, staffed by civil servants.

Mr. F.X. Talbot was transferred from the Department of the Naval Service in April 1920 to be chief accountant for the Air Board. A cost accounting system was set up at all stations to keep the Board fully informed of the cost of each operation, and much valuable information was compiled about the cost of flying, depreciation of aircraft, and maintenance requirements.

The equipment branch was initially under Capt. H.C. Craig, appointed in July 1920, with S.G. Tackaberry as air equipment officer and a staff of storekeepers at headquarters in Ottawa and at Camp Borden. The main stores depot was located at Camp Borden where there was ample accommodation for all the gift equipment which had been shipped from Britain.

As the Air Regulations required semi-annual medical examinations for all licensed pilots a medical officer, Capt. F.R. Smith, was appointed to the Air Board late in 1919. When the CAF was formed in 1920, a second medical service was established to examine recruits and provide medical duty at Camp Borden. The Board decided, however, that the work could be done more economically and efficiently by combining the civil and air force duties in a common medical service and Dr. W.H. Cronyn was appointed Director of Medical Services in July 1920. Arrangements were made to have recruits for the CAF and applicants for civil certificates medically examined in the principal centres of Canada by qualified doctors at a stated fee. At Camp Borden the station hospital and other medical services were under a resident CAF medical officer. Dental services were provided by the Army, through arrangement with the Director of Dental Services.

In February 1920 Capt. F.C. Higgins, who had been in charge of the Intelligence Branch of the overseas CAF formed in 1918, was appointed Aeronautical Intelligence Officer in the Air Board. Under his direction a departmental library of about 1,000 carefully selected volumes was built up, which, it was hoped, would expand into a well-equipped aeronautical library for the use of the public interested in aviation. The branch prepared reports and statistics on Air Board activities, distributed to the public official notices issued by the Controller of Civil Aviation, and supplied information to other government departments and private individuals; aeronautical intelligence was exchanged with the other Dominions, and much assistance was received from the British Air Ministry and the U.S. Army Air Service.

The Associate Air Research Committee which was formed in February 1920, held nine meetings during the year and outlined a programme of research. With the intent that the work should be "of the most practical nature" it was restricted "to the immediate problems peculiar to aviation in Canada, such as the operation of aircraft in low temperatures, the effect of Canadian

climate on doped fabric, and other similar practical questions".(1)

To this end, research grants totalling $4,500 were made to Prof. Angus of the University of Toronto for the investigation of carburettor operation at low temperatures, to Prof. Robb of the University of Alberta for the investigation of the operation of water-cooled engines in low temperature, and to Mr. Stanley Smith of Edmonton for experiments on the improvement of barograph diaphragms Prof. McKergo of McGill University was also working on anti-freeze mixtures. Arrangements were made with Mr. J.H. Parkin of the University of Toronto to use the wind tunnel there for experimental work required by the Air Board.

Recognizing the need for a strong technical branch to undertake its engineering and scientific work, the Air Board received approval for the appointment of a Director of Technical Services and at the end of October 1920, the Civil Service Commission selected Lt. Col. E.W. Stedman for the post. "An officer of the widest experience in aeronautical engineering," Stedman had joined the National Physical Laboratory at Teddington, England, after graduating from university, and subsequently served with the Royal Naval Air Service, during the war, on aircraft development projects. He was closely associated with the production of the Handley-Page bomber and with its first use on operations in France. Later in the war he commanded an aircraft depot. In the spring of 1919 he came out to Newfoundland as technical officer for the Handley-Page entry in the trans-Atlantic race for the Daily Mail prize. For more than a quarter century he directed the technical and research work of the Air Board, CAF and RCAF.

Under Lt-Col Stedman a technical staff was built up to operate the Air Board's workshops and repair depots, and to advise the Civil Aviation Branch on all technical matters concerning the certification of aircraft airworthiness. F/L J.A. Barron, an RAF officer seconded for duty under the Air Board, was appointed Assistant Director to advise on lighter-than-air-craft. The gift equipment from the United Kingdom, it will be recalled, had included a number of airships and balloons with the necessary stores. Thoughts of establishing lighter-than-air services in Canada, however, did not go beyond some proposals for routes down the MacKenzie which were soon dropped. Apparently, the only use made of the lighter-than-air equipment was in the use of the fabric to patch the hangar roofs at Camp Borden.

Following up the arrangements made with Sir Frederick Stupart, Director of the Meteorological Service, one of his staff, Mr. J. Paterson, visited all Air Board stations to instruct personnel in the use of pilot balloons for the measurement of upper air currents. Daily observations were taken and forwarded to the head office in Toronto.

By the close of 1920 the Air Board had rounded out its organization and all branches were in operation -- civil aviation, flying operations, CAF, technical services and the several ancillary services. The total expenditure on the Air Board in the 1920-21 fiscal year was $2,038,273, of which

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(1) Air Board Report for 1920; p. 14.

$1,656,356 came from the Air Board vote ($1,900,000), $351,372 from the demobilization vote, and $30,545 from the cost of living bonus. The CAF's share of the total expenditure was $842,068.(2)

(2) Hansard, 1922 Session; Vol. I. pp. 382-3.

Chapter IV

Trans-Canada Flight 1920

The first major operation undertaken by the Air Board and its component branches was a trans-Canada flight in the autumn of 1920.(1) The idea of such a flight had been broached over a year earlier by Major C. MacLaurin, the Acting Director of the Royal Canadian Naval Air Service, who, on 4 April 1919, submitted to his Deputy Minister a memorandum outlining a proposal for a transcontinental flight by a flying-boat. The objects of the flight were threefold: "to stimulate interest throughout Canada with regard to aviation; to encourage the development of Hydro-Air-craft, and to bring before the public the possibilities of this form of locomotion; to demonstrate the adaptability of this type of craft to this country in contra-distinction to land machines." Thanks to its "enormous lakes and rivers" Canada was well suited for flying-boats or seaplanes which could be used for many purposes. The starting-point for the propaganda flight would be Halifax and the terminus, Victoria. MacLaurin recognised that the Rocky Mountains presented the greatest problem, but he believed that they were more accessible to water-craft than to land machines, "owing to the existence of lakes and rivers."

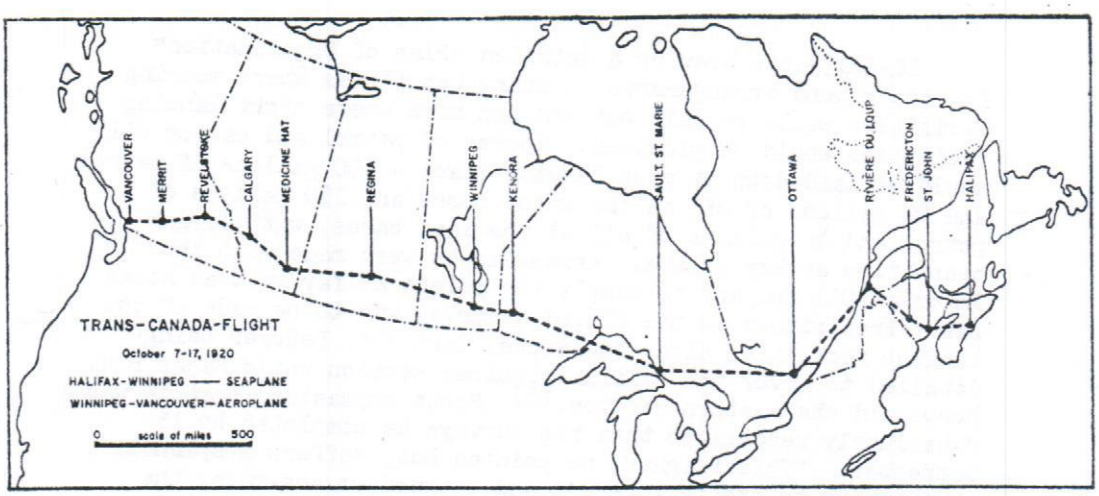
In a subsequent memorandum MacLaurin presented a detailed schedule for his project which he had now expanded to include a return trip. The outward flight of 3925 miles would be flown in 17 legs, ranging from 65 to 425 miles; the return flight of 3825 miles would be made "in as long jumps as possible with a view of competing with Railway communication." He estimated that the round trip of 7750 miles would be completed in 111 hours at an average speed of 70 miles per hour. The cost, he calculated, would be $5000 for fuel, oil, shipping expenses and a preliminary survey, but not including the cost of the aircraft, an F-3 flying-boat, which he hoped the Air Ministry would present for the project. A cable was accordingly sent to the Admiralty on 12 May, asking what the Air Ministry's conditions would be. After a long delay the Air Ministry replied on 5 August that the equipment required could be supplied for £17,054, including the aircraft, spare engines, propellers and parts, tools, packing cases and freight. By the time this reply was received the Air Board had been appointed in Canada, and the Department of the Naval Service informed the Board that it did not "propose to take any action ... at present" on MacLaurin's project.(2)

A stimulus for would-be trans-continental airmen was provided by Senator W. Dennis, proprietor of the "Halifax Herald", who offered a prize of $5,000 for the first successful

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(1) Unless otherwise indicated the material for this chapter has been drawn from the seven volumes of A.F.H.Q. file 1008-1-35 which incorporates several Air Board files and one from the Department of the Naval Service.

(2) MacLaurin subsequently became an employee of the Air Board and was serving as air station superintendent at Vancouver when the trans-Canada flight was completed in 1920. He was killed in a flying accident at Vancouver on 11 September 1922.



flight between Halifax and Victoria, the time limit being September 1919; there were no entrants for the prize. After the deadline, a Vancouver aviator sought the help of the Board or the Post Office Department in making a trans-Canada flight. The Board replied that, until routes were surveyed from the air, "an attempt to fly a single machine under a single pilot across Canada is not one to which it is advisable that the Air Board should give encouragement." It emphasized that "the prime importance of ground organization must be realized by the public"; a premature flight might retard progress.

By the summer of 1920 some preliminary ground work had been done and on 12 August 1920 W/C Scott, Superintendent of the Certificate Branch in the Air Board, sent a memorandum to the Secretary asking that the next meeting of the Board consider a submission for a trans-continental flight from Halifax to Vancouver to be carried out, about the middle of September, by seaplane to Winnipeg and by landplane over the remainder of the route. The objects were "to demonstrate the feasibility of such a flight from a commercial point of view; to prove the possibility of a fast trip from coast to coast without undue strain on the pilots or machines; and to serve as recruiting propaganda for the Canadian Air force and to stimulate an interest in aviation by commercial firms and the public generally." He estimated the flying time at 40 hours and the cost at $7,000.(3)

The Air Board approved the proposal and detailed planning began with all three branches participating. The Certificates Branch under Lt.-Col. Scott would organize ground facilities from coast to coast, including air routes and refuelling arrangements. The Operations Branch under Lt.-Col. Leckie would undertake the first part of the flight between Halifax and Winnipeg, using a Fairey seaplane then being erected at Montreal by Canadian Vickers Limited. (4) The Canadian Air Force under A/C Tylee would fly the Winnipeg-Vancouver section, using relays of three DH9a's which were to be shipped by rail from Camp Borden to Winnipeg and Morley for erection by an advance party of the CAF. The latter part of September was set as a tentative date for the flight.

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(3) The file contains a long undated, unsigned memorandum proposing a trial flight from Halifax to Vancouver as "a pioneering achievement along lines never attempted before." The anonymous author stresses the military aspects of the flight, to demonstrate the possibility of moving troops from coast to coast, an of establishing communications between far distand bodies of troops. The flight would also be good recruiting propaganda for the C.A.F. The details correspond closely to those of the subsequent flight.

(4) The seaplane, a Fairey C.3, was originally designed for the trans-Atlantic race in 1919, but construction was suspended after the NC-4 and the Vickers "Vimy" successfully crossed the ocean. Air Foreman

Lt.-Col. Scott drew up a detailed "Plan of Organization" for the ground arrangements, listing ten places where mooring facilities would be laid out and ten more where night landing facilities would be provided. Stores of petrol and castor oil would be laid down at each landing-place - 500 gallons of petrol and 20 gallons of oil at the water bases and 150 gallons of petrol and 10 gallons of oil at the land bases, with larger quantities at key points. Arrangements were made with the Imperial Oil Company to supply the points as far west as Moose Jaw. Preliminary to the flight a survey was to be made of the landing facilities along the route, Capt J.A. LeRoyer being detailed to cover the Halifax-Winnipeg section while Major B.D. Hobbs did the western section.(5) Scott emphasized that it was "absolutely necessary" that the surveys be completed by 15 September. "This flight", he pointed out, "offers a splendid opportunity to create interest and enthusiasm regarding the establishment of landing facilities and for flying boats in the various cities, towns or municipalities and every effort should be made in that direction by the Inspector ..... In every one of the places surveyed an effort should be made ... to get in touch with ex-RAF officers or men so as to ensure their interest and their co-operation in the work...."(6)

The aircraft required for the western section of the flight were shipped from Camp Borden early in September, three DH9a's and equipment leaving for Winnipeg on the 5th, followed by a fourth for Morley four days later. At the same time an advance party headed by Capt. G.A. Thompson with six fitters and riggers left Camp Borden on the 8th for the western bases.(7) The de Havillands reached Winnipeg on 13 September, erection of them began at once, and the first machine was ready for testing on the 17th.

With the preliminary arrangements apparently well in hand the Secretary of the Air Board on 17 September wrote to the lieutenant-governors of all the provinces (except British Columbia), informing them of the proposed flight and offering to deliver by air messages of greetings to the lieutenant-governors of the western provinces. Similar letters were sent to the mayors of Halifax, Winnipeg, Moose Jaw and Calgary. All letters intended for the flight were to be sent to the superintendent of the air station at Halifax by 25 September. The

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(5) Capt. CB. de T. Drummond was originally detailed for the Winnipeg-Vancouver section, but documents on the file indicate that the survey was done by Major Hobbs. He was in Winnipeg early in September to select a landing-site on the Red River for the seaplane, and was proceeding thence to Vancouver.

(6) Private parties were to be encouraged to establish permanent landing facilities along the route and to apply to the Air Board for air harbour licenses.

(7) Five of the airmen, G.E. Joel, W. Young, J. McLaughlan, T.E. Rigby and J. Crowe, had been with the C.A.F. advance party at Camp Borden. The sixth, R.G. Ford, was an early employee of the Air Board stationed at Camp Borden as an air foreman mechanic. For the trans-Canada flight he was attested and enlisted in the C.A.F. as a flight sergeant for the usual one month tour of duty. It was hoped that "the presence of a man of Ford's type in C.A.F. uniform in the west will do much to stimulate recruiting."

Air Board agreed to a request from the Halifax "Herald" to carry copies of that newspaper on the flight to Vancouver.

At this stage it was considered that, to take advantage of the full moon for night flying, the flight should start on 27 September - unless weather conditions intervened. The plan was that Lt.-Col. Leckie would leave Halifax with the Fairey seaplane on the afternoon of the 27th and fly non-stop to Winnipeg where he would arrive on the evening of the 28th. The CAF would then take over, Capt. J.B. Home-Hay flying a DH9 during the night to Moose Jaw, where Capt. G.H. Pitt would take off immediately for Calgary, landing there shortly after daybreak. From Calgary, Capt. G.A. Thompson would complete the flight to Vancouver, with a refuelling stop at Vernon; he was expected to reach his destination about noon on the 29th, less than 48 hours after the start from Halifax.(8) A return flight was being contemplated, but the details had not been completed.

With only a few days to take-off time a succession of delays and mishaps intervened to postpone the start for ten days. Leckie left Ottawa on the 22nd to take over the Fairey seaplane at Montreal, hoping to fly through to Halifax the next day. Heavy fog over the river prevented him from taking off on the 23rd, and when a test flight was later made, the performance of the seaplane was "disappointing" as it was unable to take off with a full load of gasoline and supplies.(9) After another test flight on the 27th Leckie hoped that it would be possible to make a start two or three days later. Although he still intended to complete the Halifax-Winnipeg leg on the Fairey, the flight plan was revised to provide a substitute if necessary, and the original intention of a non-stop flight was abandoned. A twin-engined F3 flying-boat which was being erected at Vickers in Montreal was to fly to Riviere du Loup and stand by in case of an accident to the Fairey. After the seaplane left Riviere the F3 would fly on to Ottawa and stand by there until the morning when it would continue to Sault Ste. Marie where Leckie intended to land to refuel.

Meanwhile more concern had arisen over the supplies of gasoline and oil that were to be laid down at points along the route. Between 9 and 15 September the requisite stores had been despatched from Sarnia by boat and rail to fifteen landing places between Fredericton and Lethbridge, but acknowledgement of arrival of the stores was slow in coming in. On the 24th only five places had reported that the supplies were on hand, and the Imperial Oil Company sent wires to its agents asking for reports as the flight was being held up pending this information. Lt-Col Scott emphasized "that the success of flying in Canada will depend largely upon their (the agents')

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(8) Capt. C.W. Cudemore would stand by at Winnipeg as spare pilot; Cudemore and Pitt had both taken a short course in the School of Special Flying at Camp Borden from 11 to 23 September in preparation for the flight.

(9) An official of the Fairey Aviation Company Ltd. suggested, in a letter to Leckie on 29 September, that an adjustment of the float angles might be the answer, and offered to send an expert rigger. The writer of the letter added: "I see the hands of the Vickers Press representative in this report... we have suffered from their propaganda in similar matters at home...."

co-operation and assistance". There was little point in gaining an hour's time by flying if it was to be lost by lack of proper refuelling facilities. The wires were also humming with telegrams from and to Ottawa concerning mooring facilities, marking of fields and other arrangements. Another hitch developed over the meteorological forecasts from Toronto; neither Ottawa nor Halifax received any forecasts prior to the 28th. As a result of these complications the Air Board notified Winnipeg, Morley and Vancouver that the flight had been postponed for a week.

Finally, at noon on 29 September, Lt.-Col. Leckie departed from Montreal with the Fairey seaplane en route for Halifax. He passed over Quebec at 2.20 p.m., but, later in the afternoon, fog forced him to land on the Saint John river 14 miles west of Fredericton. His hopes of continuing to Halifax the next day were thwarted by more fog and heavy rain which caused a "complete failure" of the ignition system in the seaplane, forcing him to wire to Ottawa for two mechanics and spare magnetos. While Leckie was grounded in New Brunswick, the spare F3 flying-boat left Montreal in the late afternoon of 3 October in charge of Capt. H.A. Wilson to take up its station at Riviere du Loup. En route darkness forced the pilot to land at Three Rivers where it was necessary to carry out some repairs to the aileron control and magneto before continuing to Riviere on the morning of the 6th. Although it was still hoped to start the trans-continental flight on Wednesday, 6 October, the inability of the Fairey to take off with "less than half" the load for which it was designed made it necessary to modify the plans once more. The new schedule proposed a departure from Halifax at midday on the seaplane with a non-stop flight through to Riviere du Loup where a landing would be made about one hour before dark. The crew would then transfer to Wilson's F3 and continue to Ottawa, landing there at midnight to refuel. Another refuelling stop would be made at the Soo shortly after daybreak, and the flying-boat would then go straight through to Winnipeg, arriving shortly after dusk.

But the seaplane had not yet reached the take-off point. Although repairs to the ignition system had been completed by the night of 3 October it was impossible to take off from the river at Clark's Farm by Kingsclear due to the number of logs brought down by the freshets, and Leckie arranged to have the seaplane towed down the river to Fredericton. One float was leaking in the aft compartment, but this was not expected to delay departure the next morning. When Leckie tried to take off on the 4th, however, the Fairey was unable to get airborne "probably owing to water in float". While the crew tried to carry out repairs "by slinging machine under foot bridge", Major A.B. Shearer, the air station superintendent at Dartmouth, flew up to Fredericton with an HS2L flying-boat. Leckie proposed to fly back to Halifax with the HS2L, start the trans-continental flight with it on the scheduled date (6 October) and transfer to the Fairey at Fredericton if it was serviceable by that time. Speedy repairs to the seaplane made it unnecessary to put this proposal into action and on the afternoon of the 5th the Fairey took off from Fredericton, passed over Saint John an hour later and landed at Halifax at 4 p.m. Shearer followed on the HS2L. That evening Leckie wired to Ottawa that he was ready to start the flight the next day and asked where the F3 was and whether arrangements in the west were completed. But Capt. Wilson and the F3 were still grounded at Three Rivers, and when he did reach Riviere on the morning of the 6th he found "few facilities for refuelling; much delay in securing hose ..." This set-back coupled with unfavourable weather - strong west wind, low clouds

and rain - and contaminated fuel[10] forced another postponement. The schedule as now revised was: depart from Halifax on the Fairey at 8 a.m. on 7 October, arrive at Rivière du Loup at 1250, change to F3 and leave at 1450, arrive at Ottawa at 2050, refuel and depart at 2240, arrive at the Soo at 0600 on the 8th, refuel and leave at 0800, and land at Winnipeg at 1815, thirty-six hours after leaving Halifax.

The start was made as scheduled. At 0800 in the morning of Thursday, 7 October, Lt.-Col. Leckie, Major Hobbs and mechanic C.W. Heath took off from Halifax on the Fairey seaplane to begin the transcontinental flight. At 1047 the aircraft passed over Saint John where Leckie dropped a message "am bucking a forty-mile northwest wind; machine and engine O.K."[11] The next report, less than an hour later, was a telegram from Montreal: "reported seaplane crashed at Whelpleys Point, Long Reach, on the Saint John River". A few minutes later confirmation of the report came from Leckie: "Regret to report forced landing 20 miles north of Saint John. Fairey machine crashed. I am arranging to continue flight in flying-boat from Halifax." Damage to the seaplane was limited to the undercarriage and propeller; it was beached at Whelpleys Point opposite Grand View railway station where it was subsequently dismantled and shipped to Halifax.

When the seaplane left Halifax that morning, Major Shearer followed it on an HS2L, intending to fly as far as Saint John in case Leckie had any trouble. After a few minutes in the air, however, he was forced to land on Bedford Basin and returned to base. When word was received of the accident to the Fairey, Shearer set out again at 1300 and, fighting strong head winds and bad weather, reached the scene of the forced landing at 1710. Over the Bay of Fundy the air was so turbulent that Shearer, handicapped by cramps in an injured leg, had to get his mechanic to assist him on the rudder. Ten minutes after the HS2L landed at Whelpleys Point Leckie, Hobbs and Heath took off for Fredericton where they landed at 1810, refuelled and resumed their flight to Riviere du Loup an hour later. The night was misty and the crew had to fly largely by compass. By the time the HS2L landed on the St. Lawrence at 2305 any hope of continuing the flight that night on the F3 flying-boat was washed out by low cloud and heavy rain.

The take-off from Rivière du Loup (Fraserville) the next morning was tricky as "a heavy sea was running, waves breaking over the top plane of the F3 ...." Nevertheless Leckie got away safely at 0620 (8 October), followed ten minutes later by Wilson on the HS2L.[12] The progress of the two aircraft was reported

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(10) The petrol which had been shipped to Dartmouth in wooden barrels was very dirty and contained much water, making it necessary to filter the fuel carefully. Leckie warned Ottawa so that the other refuelling points could be cautioned.

(11) Arrangements had been made with the Radiotelegraph Branch of the Department of the Naval Service to have wireless stations, lighthouses and signal stations on shore report the progress of the aircraft from Halifax to Winnipeg. Many reports were also received from telegraph agents, newspapers and private individuals at points along the route.

(12) Although the aircraft had been refuelled the crews were apparently less fortunate. On leaving Rivière, Leckie wired to Ottawa "..... arrange to have six hot breakfasts ready at Air Station Ottawa."

stage by stage as they flew up the St. Lawrence, the single-engined HS2L dropping farther and farther behind the faster F3. Leckie was reported over Crane Island at 0743, Quebec at 0828, Grondines at 0910, Three Rivers at 0940, Sorel at 1013, and Montreal at 1055. Over the first part of the course the clouds were low at 300 feet; the weather continued bad to Three Rivers and then began to improve. By the time Montreal was reached the sun was shining and the weather was ideal. After a six-hour non-stop flight the flying-boat landed on the river at Ottawa at 1230, where Leckie delivered a letter from the mayor of Halifax to the mayor of Ottawa, and arranged to have other letters which he had carried for the mayors of Fredericton, Quebec and Montreal sent to their destinations by rail.(13) Engine trouble delayed the departure of the flying-boat from Ottawa and necessitated another revision in the schedule, calling for a refuelling stop at the Soo at 1800 on the 9th and departure at 0200 on the 10th to avoid if possible a night landing on the Red river at Winnipeg. While the flying-boat was undergoing repairs at Ottawa, Lt.-Col. Scott, Superintendent of the Certificates Branch, registered his disapproval that the F3 did not carry the registration markings (G-CYBT) that had been assigned to it; it set a bad example to civil and commercial operators if the Air Board did not observe its own regulations!

At 0845 on the morning of 9 October Leckie and Hobbs, with Capt. G.O. Johnson now in the crew as navigator, took off from Ottawa and passed over Pembroke at 1000, maintaining an average speed of 60 m.p.h. A message was dropped at Mattawa at 1118 to report "engine and machine O.K., foggy with following wind", and at North Bay at noon another message confirmed that all was well. Subsequent reports placed the flying-boat over Little Current at 1415, Blind River at 1512, and Thessalon at 1555. Forty minutes later the F3 landed at the Soo. Mechanic J.E. Davies had the refuelling and other arrangements ready for departure about midnight, as Leckie had scheduled, but dense fog forced a delay of several hours. At 0730 on Sunday morning, the 10th, the F3 finally got away from the Soo, passed over Port Arthur "going strong" at 1207, and landed at Kenora at 1555 E.S.T. (1455 C.S.T.) to refuel and repair a leaking radiator. Hopes of getting away within an hour were dragged out for several hours longer until the trouble was eventually rectified and at 2015 C.S.T. the flying-boat took off from Kenora on the final leg of 155 miles to Winnipeg. All hope of avoiding a night landing was gone now. From Kenora the Winnipeg river was followed northwestward to Lake Winnipeg where course was changed southward to fly up the Red river to Winnipeg. Thick haze, however, obscured the ground, and the pilot had to set his course by the stars. By the time the flying-boat reached the Red river darkness and heavy ground

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(13) In the hurry of departure from Fredericton the crew had forgotten to deliver the letter for the mayor of that city, and through oversight or lack of message containers had failed to drop the other two letters while passing over Quebec and Montreal. A new supply of mail droppers was arranged at Ottawa. In the early planning for the flight when a night landing had been proposed at Ottawa, it had been arranged to fire rockets from the roof of the Government Printing Bureau at ten-minute intervals, starting 15 minutes after the aircraft passed over Grenville, about 50 miles below Ottawa. At Rockcliffe ground flares would be lit when the flying-boat came in sight. Events made these pyrotechnics unnecessary.

mist forced Leckie to land at Selkirk, some miles short of Winnipeg, at 2245. The mail was sent on to Winnipeg by car so that the flight could be continued by land-plane at dawn. The next morning Leckie brought the F3 from Selkirk to Winnipeg in half an hour to complete the Flying Operations Branch's part of the trans-continental flight. From the Air Board he received a message of "heartiest congratulations to yourself and members of your crew on successful completion Halifax to Winnipeg flight"; to which he replied that the "flight has served very useful purpose everywhere I have stopped." After making arrangements for repairs to the port engine of the flying-boat, Leckie continued his journey westward by rail.

While Leckie had been making his way from Halifax to Winnipeg in the face of repeated mishaps and setbacks, the CAF had completed arrangements for its share of the enterprise, the Winnipeg to Vancouver flight. One of the DH9a's had been crashed in a test flight at Winnipeg on 1 October, but the other three machines were in their allotted positions. From the afternoon of the 7th A/C Tylee and Capt. Home-Hay were standing by at Winnipeg with their DH9 "loaded and ready to start". On the 8th and 9th Capt. Cudemore, who had replaced Pitt as pilot, flew a second de Havilland from Winnipeg to Moose Jaw, making an overnight stop at Virden due to head winds of gale strength. At Calgary Capt. Thompson was ready with the third aircraft which had been erected at Morley.

When the mail carried by the F3 had been brought in from Selkirk, Capt. Home-Hay with A/C Tylee as a passenger on his DH9a took off from Winnipeg at 0430 on the morning of Monday, 11 October. The CPR tracks served as a guide across the prairies. Agents reported the passage of the aircraft over Grenfell at 0739 and Regina at 0845 C.S.T. (0745 M.S.T.). At the Saskatchewan capital, however, engine trouble forced Home-Hay to turn back and land. Cudemore was then instructed to come from Moose Jaw, pick up Tylee and the mail and continue the flight. Two hours and a quarter later the second de Havilland was on its way from Regina, passed Moose Jaw at 1042, Swift Current at 1158, and landed at Medicine Hat at 1345 after bucking a strong head wind. In the interim Thompson had flown east from Calgary to pick up Tylee and the mail at Medicine Hat. The two aircraft then resumed the flight at 1510 and landed at Calgary at 1710. Thompson intended to continue the flight the next morning, but "snow, rain and fog in the mountains" necessitated a postponement until Wednesday, the 13th. At 1155 M.S.T. that morning Thompson and Tylee took off on the next lap, passed over Sturdee, just east of Glacier, B.C., and at 1510 landed at the Crowle ranch four miles south of Revelstoke. Here the de Havilland was grounded by "excessive fog" and "weather most unfavourable for flight" until 1150 on the morning of Friday, the 15th. Good time (98 m.p.h.) was made then as far as Merritt, but fog in Coquihalla Pass forced Thompson to turn back when half-way through and he returned to Merritt to refuel and spend the night. The next day bad weather frustrated a second attempt to get through the pass. Finally, at 0940 on Sunday, the 17th, Thompson and Tylee took off from Merritt, passed over Agassiz an hour later, and landed at Minoru Park, Vancouver, at 1125 to complete the first flight across Canada "A Mari Usque Ad Mare" (14)

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(14) The arrival of the DH9a at Vancouver was shown in an all-Canadian newsreel (Canadian National Pictorial No. 67) made by the Pathescope of Canada, Ltd., under the direct supervision of the Exhibits and Publicity Bureau of the Department of Trade and Commerce, which was released for exhibition early in November 1920. During the flight across the Rockies A/C Tylee took a number of still photographs.

The total flying-time for the six aircraft on the 3341-mile route from Halifax to Vancouver was 49 hours and 7 minutes spread over a period of ten and a half days; average speed over the whole course was 68 miles per hour. The flight had certainly not been completed as expeditiously as the Air Board had hoped. Instead of four hops, as the optimistic planners had initially proposed, the aircraft had to make thirteen, ranging from 45 miles to 540. The overall elapsed time of almost ten and a half days (247.25 hours) from start to finish did not compare very favourably with the railroad schedule of 132.10 hours for the same course. Nevertheless as "a pioneer effort in Canada" the Air Board had reason to be proud of its achievement in the face of bad weather, the crash of one aircraft, and engine trouble on two others. The flight had underlined the Air Board's own comment on a previous occasion of "the prime importance of ground organization."(15)

Commenting on the part of the flight undertaken by the Flying Operations Branch, Lt.-Col. Leckie said that the section of the route from Lake Nipissing to Georgian Bay presented the greatest difficulty in navigation because "the innumerable small lakes and islands, all of a similar size and character," made it difficult to maintain the correct course along the French River. Of the three aircraft used on the eastern part of the flight, the HS2L served its purpose very well, was a pleasant machine to fly by day or night, and being strongly built was particularly adapted to rough usage. The twin-engined F3 was also comfortable to fly by day or night and was a good general type for long distance work; but its "uncontrollability" on the water was a bad feature, especially on narrow lakes where it was "practically impossible to bring this seaplane ashore under its own power without doing damage to hull or wings." Three Rolls Royce "Eagle VIII" engines were used in the Fairey seaplane and F3 flying-boat. (The HS2L and the three DH9a's had 400 hp "Liberty" engines.) The engine installed in the Fairey "gave perfect satisfaction": it "ran very sweetly developing its power satisfactorily. No engine trouble of any kind was experienced...." On the F3 the starboard engine "ran very satisfactorily from first to last, though it was not quite such a nice engine as the one installed in the Fairey." The port engine, however, gave considerable trouble, including extensive plug trouble at Ottawa which cut the revolutions to 1400, more trouble at Kenora where one broken valve spring was found as well as a stuck inlet valve, and finally at Winnipeg where five broken valve springs were discovered. Both engines had lost compression and the valves were blowing, the leakage apparently occurring past the piston rings. It was disappointing that both engines required a top overhaul after only 40 hours' flying.

Summing up his comments on the western part of the flight, A/C Tylee wrote:(16)

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(15) "An analysis of the causes for the various delays has shown that the difficulties encountered were those arising rather from a lack of sufficient ground organization, than from any inherent difficulties in flying as such." Air Board General Progress Report No. 5.

(16) The complete text of Tylee's report has not been found, only an extract of his conclusions.

"The flight has thoroughly convinced me that trans-continental flying can be successfully undertaken. At the same time the following ground organization will be necessary:

(i) Well marked aerodromes every fifty miles.
(ii) Wireless communication on the machine.
(iii) Wireless directional apparatus on the ground to guide the machines as they are flying.

"Until wireless directional apparatus is properly installed as an aid to aerial navigation, weather forecasts are indispensable. What is wanted is a report at one station what the visibility, height of clouds and direction of wind will be at the next stopping place at the time the machine will arrive."

In its final summary of the operation the Air Board said:

"The flight was undertaken under most adverse weather conditions. Notwithstanding this, it was safely accomplished. The difficulties encountered increased the value of the experience gained, and showed that, even in unfavourable circumstances, long-distance flying by night and day was quite feasible in Canada."

"The breakdown of one machine, and engine trouble on the eastern half of the route, accounted for the loss of about 24 hours' time; (more) days were lost in the mountains in British Columbia through snowstorms, fogs, and low-flying clouds which completely filled the mountain valleys. It is interesting to note that two of the most difficult sections of the flight were flown with ease and without loss of time in the dark, under unfavourable weather conditions, and with absolutely no moon to assist. These sections lay between Fredericton and Rivière du Loup, and between Kenora and Winnipeg. The latter from Kenora up the Winnipeg river to lake Winnipeg and down the Red river as far as Selkirk had never been flown over before. The experience gained proves that with sound ground organization and relays of suitable machines, a service could be undertaken which would run with a high percentage of regularity and with a time schedule which would average slightly over 40 hours for the trip from Halifax to Vancouver, and less for the return journey. The prevailing westerly winds would increase the average speed of the eastward flight and retard the western passage. This would be counterbalanced, in part, by the difference in time of four hours between Halifax and Vancouver."(17)

Although it had originally been proposed to make a return flight with the same aircraft the two leaders, Tylee and Leckie, decided after a discussion at Vancouver to abandon the project. The DH9a which Thompson had flown to Vancouver was shipped back to Calgary and, with Cudemore's aircraft, was turned over to the Operations Branch for use at Morley; Home-Hay's de Havilland was returned from Moose Jaw to Winnipeg for dismantling. It was planned to fly the F3 back east from Winnipeg after repairs had been made, but Capt. N.G. Fraser, who had been left in charge of the aircraft, encountered "much trouble with broken valve springs and leaking radiators." After three weeks of continued efforts to put the flying-boat in order before cold weather set

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(17) Air Board Report for 1920; p. 14.

in, it was finally put in storage on the banks of the Red river. The HS2L which had been used as replacement for the Fairey seaplane on the flight to Riviere du Loup was subsequently brought to Ottawa by Capt. H.A. Wilson and then returned to its base at Dartmouth.

TIME-TABLE of TRANS-CANADA FLIGHT, 7-17 October 1920

From	To	Date	Dep.	Arr.	Flying Time	Mi.	Ave. Speed	Aircraft	Crew	Remarks
Halifax	Whelpleys Pt.	7 Oct	AST 0800	1105	3.05	165	55	G-CYCF(N.9256) Fairey C3	Leckie, Hobbs, Heath	50 m.p.h. headwind. Seaplane forcelanded.
Whelpleys Pt.	Fredericton	7 Oct	1720	1810	.50	45	54	(A.1941) HS2L G-CYAG	Leckie, Hobbs, Heath	Landed to refuel
Fredericton	Riviere du Loup	7 Oct	1915	AST 2305	3.05	220	57	HS2L do.	Leckie, Hobbs, Heath	Misty; night flying largely by compass
Riviere du Loup	Ottawa	8 Oct	EST 0620	1230	6.10	390	64	(N.4016) F3 G-CYBT	Leckie, Hobbs, Heath	Clouds at 300 ft. and weather bad to Three Rivers; then improved; sun out and ideal weather at Montreal.
Ottawa	Sault Ste. Marie	9 Oct	0845	1635	7.52	484	61	F3 do.	Leckie, Hobbs, Johnson, Heath	Delayed by engine trouble. Weather fair at first, then low visibility and navigation difficult.
Sault Ste. Marie	Kenora	10 Oct	0730	EST 1555	8.25	540	63	F3 do.	Leckie, Hobbs, Johnson, Heath	Refuelled; delayed by heavy fog, then weather ideal; headwind.
Kenora	Selkirk	10 Oct	CST 2015	EST 2245	2.30	155	62	F3 do.	Leckie, Hobbs, Johnson, Heath	Delayed by engine trouble. Thick haze; set course by stars.
Total					32.42	1999	61			Carried out by Flying Operations Branch

From	To	Date	Dep.	Arr.	Flying Time	Mi.	Ave. Speed	Aircraft	Crew	Remarks
Winnipeg	Regina	11 Oct	CST 0430	CST 0845	4.15	367	85	DH9a	Home-Hay, Tylee	Followed CPR tracks; forced down by pressure feed trouble.
Regina	Medicine Hat	11 Oct	MST 1000	1345	3.45	290	77	DH9a	Cudemore, Tylee	Strong headwind. Landed to refuel.
Medicine Hat	Calgary	11 Oct	1510	1710	2.00	180	90	DH9a	Thompson, Tylee	Wind slackened.
Calgary	Revelstoke	13 Oct	1155	MST 1510	3.15	210	65	DH9a	Thompson, Tylee	Delayed by mist, rain, snow. Forced to land because of clouds.
Revelstoke	Merritt	15 Oct	PST 1150	1315	1.25	140	98	DH9a	Thompson, Tylee	Delayed by clouds, rain and mist.
Merritt	Vancouver	17 Oct	0940	PST 1125	1.45	155	88	DH9a	Thompson, Tylee	
Total					16.25	1342	81			Carried out by Canadian Air Force
Grand Total					49.07	3341	68			

Note: 1. For uniformity, the same time zone has been used for each leg of the flight.
2. The Air Board Intelligence Branch report of the flight shows take-off from Ottawa on 9 October at 0845 and arrival at Sault Ste. Marie at 1635, but gives the elapsed time as 7.52 hours.

Chapter V

A. Parliament in 1921

For Air Board operations in the 1921-1922 fiscal year the government submitted an estimate of $1,625,000, subdivided between the Canadian Air Force - $825,000, civil aviation - $700,000, and salaries and contingencies - $100,000.(1) This sum was about 14% ($275,000) less than the appropriation for the previous year. Mr. Guthrie, the Minister of Militia and Defence and Chairman of the Air Board, in presenting the estimate to the house emphasized that he had pruned the original figures considerably, paring them "right to a dollar." The Air Board was still operating with aircraft that had been donated to Canada, and so far it had not been necessary to purchase much equipment, but he warned that such purchases would be necessary as time went on. The minister expressed the opinion that the airship (sic) "will be a most valuable adjunct in naval and military matters and the like. But when we come down to the question of commercial success we will be thrown back on the lighter-than-air craft, not on the airship."(2)

Despite Mr. Guthrie's assurance that the estimate had been pared to the bone several members were quite critical. Mr. McMaster, who had attacked the air service item the previous year, rose once again to question whether the country could afford it. "I say we can't ... I wish to protest against this expenditure...on behalf of the tax-laden people - the long - suffering electors of this country - against this waste of money. Perhaps it is not an absolute waste, there will be some good obtained out of it, but we cannot afford it. The country cannot afford this experimenting with civil aviation.....As far as the military airships are concerned I would not be opposed to some reasonable expenditure upon them, because if we are to have any military expenditure whatsoever, aviation is one of the branches which has to be maintained; but this civil aviation and this most unsound and unwholesome principle of dividing expenses with the provinces on a fifty-fifty-basis, merits criticism."

Other members turned their fire on the Canadian Air Force and asked what service it rendered to the country. Referring to a number of accidents that had occurred recently,(3) Mr. Duff said it seemed "a pretty high price to pay for an air service in peace time. If we had war, of course it would be necessary to keep our air service and we would expect to have accidents. But it is a crime to render our very best young men.....liable to be killed or dangerously injured, just for the sake of having in Canada a service which is absolutely unnecessary." He was

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(1) The civil aviation item included $20,000 for licensing, inquiry into accidents, and survey of air routes, i.e. the Controller of Civil Aviation branch. The total estimated cost of civil aviation operations was $735,000, of which the Ontario and Quebec provincial Governments would repay $35,000. See Hansard, 1922 Session; Vol. II, p. 1730.

(2) The minister did not seem to be too well versed in the work of the Air Board and its components, apart from the data which he had in the estimate notes.

(3) There were three fatalities at Camp Borden between 30 March and 11 April 1921, two due to air accidents and one to an auto accident.

particularly critical of the air station at Halifax which, he charged, was "absolutely useless, either for commercial or for military purposes." There was no need for any aviation in Nova Scotia; it was "an absolute waste of money" to have the station there. To these criticisms Mr. Guthrie replied that "you cannot maintain a military or naval system of any kind, if you have not an air force in connection with it..... The naval service nowadays must have as an adjunct a seaplane service, and the best base for that on the eastern coast was considered to be at Halifax." After an hour-long debate the item was agreed to.(4)

(4) Hansard, 1921 Session; Vol. IV, pp. 3899-3908 (23 May 1921).

B. Flying Operations in 1921

Encouraged by the results of the first trial operations in the summer and autumn of 1920, the Air Board convened meetings of the Inter-Departmental Conference in November 1920 and January 1921 to discuss activities for the 1921 season. With 14 representatives present from seven different departments and agencies, plans were considered for extended operations in forestry and fishery patrols, aerial survey, exploration, communication, entomological investigation and experimental flying. In addition to the previous fields of operation in British Columbia, Alberta, Ontario and Quebec, it was proposed to begin work in northern Manitoba and New Brunswick also.(1) To carry out its programme the Directorate of Flying Operations had an operational staff of 110, including 32 licensed pilots, 1 airship pilot, 31 licensed air engineers, and 46 air mechanics; its fleet of 36 aircraft included four R3s (twin-engined flying-boats), 18 HS2Ls (single-engined flying-boats), 11 DH4s (single-engined landplanes), and three Avro single-engined floatplanes.

When operations were suspended at all stations except Vancouver at the end of October 1921 W/C Leckie's branch had made 1209 flights for a total of 2200.36 hours. Three provincial governments, Quebec, Ontario and British Columbia, had made use of its services as well as nine departments of the Dominion government, including eight branches of the Department of the Interior, the Geological Survey Branch of the Department of Mines, the Entomological Branch of the Department of Agriculture, the Exhibits and Publicity Bureau of the Department of Trade and Commerce, and the Departments of Marine and Fisheries, Customs, Railways and Canals, Public Works, and Militia and Defence; flights had also been undertaken for the Commissioner for Northern Manitoba and the International Joint Commission.

At Dartmouth there was relatively little flying during the year, as the station was still used primarily as a year-round depot for the repair and maintenance of flying-boats. Only 25 flights were made for a total of 41.25 hours, the operations including some aerial photography for the Geological Survey and a mosaic, prepared at the request of the International Boundary Commission, to cover part of the St. Croix river over which there was some dispute. S/L Shearer's station was also used for combined manoeuvres with the Army and Navy in August.

Operations at Roberval were resumed in June, after the ice had left the lake, under the direction of F/L W.R. Kenny to carry out forest survey for the Quebec Government which contributed $20,000 towards maintenance of the air station in addition to a considerable sum spent on the erection of permanent buildings. On the whole flying conditions were unfavourable during the five-month season, smoke interfering with visibility during the early period after which wet weather prevailed to an unusual extent. Nevertheless the HS2Ls made 102 flights for a total of 178.09 hours during which a wide area was surveyed.

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(1) Plans were also discussed for communication and exploratory work in the Mackenzie river basin; the Air Board withdrew from this project, however, to leave the field open for commercial companies, i.e. Imperial Oil which had purchased two Junkers J.L.6 aircraft for exploratory flights down the Mackenzie.

In anticipation of extended operations in 1922 fuel caches were laid down as far north as Lake Mistassini.

In Ontario the small base at Ottawa (Rockcliffe) was again engaged in much experimental work, chiefly in the development of aerial photography. Being the only combined land and water station in the Air Board - and indeed in all Canada - Ottawa was able to use both landplanes and seaplanes in its varied activities. In the six months that the station was open, 25 April to 4 November, 145 flights were made for a total of 269½ hours. One of the operations was a continuation of the spruce bud worm investigation which had been started at Haileybury the previous year. In 1921 an HS2L aircraft and crew detached to Haileybury from the Ottawa air station reconnoitred infected regions around Lake Timiskaming, and in ten days' flying precise information was obtained about the extent and location of the plague which it would have taken ground survey parties a whole season to obtain.(2)

As mentioned above, much of the work done by Ottawa air station was concerned with aerial photography. Experiments were continued under the guidance of Dr. Deville, including tests of a new type camera invented by Prof. H.L. Cooke of Princeton University. The Gatineau district was photographed in one experimental operation carried out in conjunction with the Geodetic Survey Branch of the Department of the Interior, and in another operation a mosaic was made of the city of London. The latter operation was initiated in March 1921 by Major Douglas H. Nelles, Supervisor of Topography in the Geodetic Survey Branch, who set forth the various technical details required for the experiment in making a large-scale mosaic. The photographs were to be used as an aid in fixing the position of topographic details on a map of the city which was to be made by a ground survey party. Nelles emphasized that the operation should begin as soon as possible before the leaves came out on the trees and bushes, and suggested that the photographs should be taken at 4,000 feet altitude with a 75% overlap on line of flight and 25% along the edge.(3) An Eastman K-1 camera was to be used with 20-inch lens and 100-exposure film. The area to be covered, 42 square miles, would require 168 miles of flying and the exposure of 25 rolls of film. The Flying Operations Branch of the Air Board at once began preparations to carry out the operation. Capt. H.L. Holland, the superintendent at Ottawa air station, and Lt. E.R. Owen, air photographic inspector, were detailed as the crew. Holland visited London to select a landing-ground and after consultation with civic officials found a suitable location on Merwin Heights. He then went to Camp Borden and took over a DH4 aircraft which had been modified for photographic work.(4) On 26 April Holland

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(2) Capt. C.H. Fitzherbert was in charge of the Haileybury operation. It was intended to carry out a similar investigation in New Brunswick but the operation was cancelled because of the lateness of the season.

(3) The large in-line overlap was required for experiments in determining the elevation of points shown in the photographs. Details of the London operations are in AFHQ file 1008-2-5. The Air Board operation order issued on 25 April specified an altitude of 5,000 feet with a 33% overlap, using six 100-negative rolls.

(4) The modifications included reconstruction of the bay in rear of the cockpit to accommodate a temporary seat and a gimbal mounting for the camera.

and Owen flew to London and, after experimenting to determine the height necessary to secure the required overlap, they completed the operation two days later. The return flight to Ottawa was delayed by rain and when Holland reached Toronto on the 30th the airfield at Leaside was still "under water" with the result that the aircraft broke its propeller on landing. Owen completed the journey to Ottawa by train and, after effecting repairs, Holland completed the flight to Rockcliffe a few days later. Major Nelles gave an address on the London operation to a meeting of the Town Planning Institute of Canada which was held in Ottawa late in May 1921.(5)

Aerial photography was also used in the early stages of planning for the St. Lawrence seaway. In May 1921 Mr. L.J. Burpee, secretary of the International Joint Commission which had been appointed to investigate "the practicability of providing a deep waterway from the Great Lakes to the sea", asked the Air Board if he could be flown along the St. Lawrence from Kingston to Montreal.(6) He thought that "a view from the air of the river and surrounding country would make it possible to interpret more intelligently the information contained in the maps." His request for the flight and for aerial photography was granted and between 5 July and 9 August thirteen patrols, totalling 36.05 hours, were made along the St. Lawrence, using an HS2L and a DH4.F/L Holland and Mr. Owen took a series of oblique and vertical photographs which were later exhibited at meetings of the Commission where they excited much interest. In expressing "the very sincere appreciation" of the Commission for the assistance given, Mr. Burpee said that the photographs were "of very real practical advantage". In many cases they threw a new and important light on the engineering problems with which the Commission had to deal, and had been of service to members of the engineering board in preparing their plans. The photographs, the commission believed, would be of even greater service in carrying out the engineering work on the St. Lawrence improvement, if the two governments decided to proceed with the undertaking - which they did, a generation later.

Another photographic operation was carried out along the Welland Canal to produce a mosaic for the use of the International Joint Commission and the Town Planning Branch of the Department of the Interior. In addition to these various photographic operations Ottawa Air Station also experimented in the use of wireless telephone intercommunication in co-operation with the Radio-telegraph Branch of the Department of the Naval Service.

The Air Board extended its activities into central Canada in 1921 with the establishment of a Northern Ontario mobile unit at Sioux Lookout and an air station at Victoria Beach in Manitoba.

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(5) The London Operation was an experiment to demonstrate what could be done in this field of aerial photography. When the Essex Border Utilities Commission requested aerial photography in the Windsor area, Lt-Col. Leckie replied that "the Operations Branch of the Air Board exists to carry out flying operations for other Government Departments. In view of the fact that there are many struggling aviation companies in Canada, it has always been our policy to restrict operations to purely Government work thus leaving the field free for commercial companies". He suggested the Commission should call for tenders for these companies.
(6) See AFHQ file 1008-1-11.

Established at the request of the federal Conservation Commission and the provincial Department of Lands and Forests, which contributed $15,000 towards expenses, the Sioux Lookout base was used for survey of the forest areas lying east of the Manitoba border and north of the transcontinental railway. Subsidiary bases were also located at Minaki and Allanwater, while some detached operations were carried out from Banning in the Rainy River district. Provincial foresters were carried on "timber-cruising" flights over an area some 200 miles wide from east to west and averaging 60 miles in depth from north to south, which enabled them to collect information from which complete and accurate maps were prepared, showing the various forest types and extent of growth. In four months of flying operations, from 20 May to 25 October, data were obtained "which it would have taken years to obtain by ordinary methods."(7)

Although the primary object of the Northern Ontario unit was forest survey rather than fire protection, it was called upon at times to assist the firefighting forces by reconnaissance and transportation of men and supplies to fire areas. In all, F/L A.W. Carter and his staff made 188 flights, totalling 329.13 hours. Thoroughly satisfied with the result of the season's work, the Ontario government asked the Air Board to expand its operations in 1922. To make a "thorough test on a large scale of the efficiency of aerial forest protection" it was proposed to carry out operations from Whitney with a sub-base at Parry Sound. The Northern Ontario unit was a new type, an experiment in mobility; four box cars on a CNR siding served as quarters and mess for the personnel and storehouse for supplies and equipment. The HS2Ls were erected on the site. Three HS2Ls were used, the aircraft being flown to Ottawa at the end of the season for overhaul.

Capt. Carter pioneered in geological reconnaissance from the air. Prof. E.L. Bruce of the Department of Mineralogy at Queen's University had been working during the summer on an examination of the country adjacent to Lake St. Joseph. On his return to Sioux Lookout in September, Capt. Carter suggested to Bruce that he fly over the region he had surveyed on foot, to see if geological reconnaissance could be done from the air or if aircraft could accelerate the work. The two men accordingly made a flight, covering in one hour a route that had taken Bruce's party four days of travel on the ground. The geologist was able to see how inaccurate existing maps were, and even in one brief flight he was able to make some additions to his geological knowledge of the region and fill in blank spaces on the geological map. Aircraft would save much time and labour in this work, by helping the geologist to eliminate unimportant areas and concentrate on those of economic significance.(8)

Another new base, which within a few years became one of the most important centres of civil government flying in Canada, was opened at Victoria Beach in the early summer of 1921. Negotiations for the lease of land for an air station on the Southeastern shore of Lake Winnipeg were completed late in April, and two HS2Ls were then shipped from Halifax while the F3 which had been left in storage on the banks of the Red river at Winnipeg was reassembled. Major B.D. Hobbs was appointed superintendent of the new station. Flying began in July and continued through the

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(7) Air Board Report for 1921; p. 10.
(8) Air Board General Progress Report No. 9; appendix 11.

next four months. The primary role of Victoria Beach was forest fire protection on behalf of the Department of the Interior. Daily reconnaissances were made of the tract between Lake Winnipeg and the Ontario boundary, where the fire danger was greatest; and once a week, from August to October, a patrol was sent to Norway House, at the northern end of Lake Winnipeg, whence the flying-boat flew south and southwest along the shores to Cedar Lake, south along Lake Winnipegosis to Winnipegosis, where it refuelled before heading east to Lake Winnipeg and back to base at Victoria Beach. The 800-mile patrol required 10 to 12 hours flying. From Norway House some long distance patrols were also flown to The Pas, Cumberland House and the Carrot River "triangle" in eastern Saskatchewan. Twin-engined F3s were used for the long-distance flights, and the single-engined HS2L for work closer to base.

At the end of July, after the initial forest fire patrols had been made, a special demonstration flight was made by Major Hobbs to enable Lt. Col. H.I. Stevenson, the district forest inspector, to investigate the possibilities of instituting forest patrols over the areas bordering on Lakes Winnipeg, Winnipegosis and Manitoba, and also to give the local district fire rangers flights over their areas. The route followed by the F3 made a complete circuit of the three lakes, starting from Victoria Beach and passing through Manigotogan, Berens River, Norway House, The Pas, Cumberland House, Cedar Lake, Grand Rapids, Winnipegosis, Sturgeon Bay and thence back to Victoria Beach. At the end of the 1080-mile flight, covered in 14.52 hours flying time, Stevenson said he was thoroughly convinced of the superiority of air patrol because of its speed and range of vision. With one flying-boat at Norway House and another at The Pas, in addition to the base at Victoria Beach, it would be possible "to do all the work at present done by ground patrol in these districts, and do it 100 times more efficiently." Patrol with canoe, he wrote, is obsolete, and "it will be possible to do the work more efficiently with aircraft and at considerably less cost than our present methods."(8) It was as a result of this successful demonstration that the weekly patrols mentioned above were instituted.

Major Hobbs' long flight served to demonstrate the utility of aircraft in two other fields. While the aircraft was at The Pas, Dr. R.C. Wallace, the Commissioner for Northern Manitoba, was given a flight to Cumberland House after which he wrote:

> "I have had considerable experience in mapping territory from the canoe and feel satisfied and more than ever impressed with the conviction that the only way in which northern territory can be mapped is by the camera from the air."

Within a few years this was to be the major role of civil government aircraft.

Also, while at The Pas the flying-boat was used to demonstrate how aircraft could reconnoitre and survey flooded areas for land drainage and reclamation projects. Mr. G.F. Horsey, a hydraulic engineer in the Reclamation Service of the Department of the Interior, was at The Pas in connection with a survey of the Carrot River triangle for a proposed drainage project to

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(8) Air Board General Progress Report No. 9; Appendix 5.

reclaim some 900,000 acres. Much difficulty had been experienced in making the survey on foot because of excessive floods and swamps in the area. At his request a special two-hour flight was made to the triangle which gave him more general information about the terrain and drainage channels than he could have secured in a month's trip on foot.(9)

In addition to the regular forest patrols and special demonstration flights, Victoria Beach did some photography along the Winnipeg river for the Water Powers Branch and provided transportation for survey parties and their supplies in the district east of Lake Winnipeg. In all, 103 flights were made for a total of 184.16 hours.

The Alberta base was moved in 1921 from Morley to High River. The former station, used in 1920 for forest patrols, had proven unsatisfactory because of prevalent high winds and its closeness to the mountains. A more suitable site was found one mile from High River, to the South of Calgary, where Major Croil established an aerodrome for his DH4s and began flying operations on 6 May 1921. By the time the station suspended activities for the winter six months later, 284 flights had been made for a total of 710.05 hours - the largest amount of flying carried out by any station during the year.

Three-quarters of the flying done at High River (215 flights) was on forest patrol. To keep watch over the Crowsnest, Bow and Clearwater forest reserves on the eastern slopes of the Rockies, two patrols were sent out daily, one flying north as far as the Clearwater river, and the other south to the international border.(10) While on patrol the aircraft were in wireless communication with their base, whence reports could be telephoned to the forest rangers. Despite operational conditions that were "by no means easy", admirable work was done. This was particularly true later in August when a big fire broke out on the western side of the Rockies and raged for twelve days. As the fire started outside the High River patrol area, it was not detected from the air until three days later (28 August) when Capt. A.A. Leitch and his observer sent back a report of a very serious fire danger. The Forestry Branch at once began recruiting crews of men in case the fire crossed the mountains. Two days later wind-carried embers jumped the main divide and flames began to spread in the Crowsnest reserve. Through the next week daily patrols reported the progress of the fire, the extent of timber burned, and the new areas threatened, thus enabling the forestry officials to deploy their fire-fighting crews to the most dangerous points. The aerial patrols were "the only means" of securing information about the fire's advance; they kept the Forestry Branch constantly in touch with the situation and guaranteed that accurate and comprehensive information would be available at all times. Regular flights were made until heavy rain and snow-fall on 8 September checked the fires. This 12-day operation was believed to be "the first occasion in Canada when aircraft have been extensively employed in this manner as an integral part of a fire fighting organization engaged in combating a fire of such unusually large proportions, and raging continuously for so many days."(11)

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(9) Ibid.; Appendix 6.
(10) Each patrol made a round trip of about 300 miles in slightly over 3 hours.
(11) Air Board General Progress Report No. 9; Appendix 7.

Another sphere of usefulness for aircraft was demonstrated in September when, at the request of the Dominion Parks Branch of the Department of the Interior, an aircraft was sent from High River to Jasper in the heart of the Rockies to make some flights for exploration and photographic reconnaissance. Major Croil took Col. Maynard Rogers, the park superintendent, for flights on three successive days during which he was able to examine from the air virtually every valley that it would be necessary to use for trail construction in the park.(12) During the flights several hitherto unknown lakes and river valleys were discovered and pinpointed, close-up reconnaissances were made of mountain peaks, valleys and passes, information was noted of the extent and type of timber, and messages were dropped to construction crews working on new trails who, in most cases, were at least two days' travel from the nearest telephone.(13)

A photographic survey was made by an aircraft from High River of the Waterton Lakes district and the courses of international waters in southern Alberta. Undertaken at the request of the International Joint Commission which was considering questions connected with water supply in southern Alberta and northern Montana, the operation saved a long delay which would have resulted if normal survey methods had been used.

The air station at Vancouver (Jericho Beach) under Major MacLaurin was second only to High River in the volume of flying in 1921 and was unequalled in the variety of operations undertaken; 487.58 hours were logged on 362 flights. Over one-third of the flying was on forest protection, reconnaissance and photography for the Forestry Branch of the Department of the Interior and for the provincial government, which contributed $20,000 towards the cost of the operations. As in the previous year a sub-station with one HS2L was established at Kamloops to keep under observation, when the fire hazard was at its peak in August, the valuable timber lands in the railway belt in central British Columbia as far east as Revelstoke.

The second major task of the station was preventive patrols, for the Department of Customs, to suppress the smuggling of opium and other drugs into Canada. The general practice of smugglers was to drop packages of contraband overboard in water-tight buoyant containers as the vessel was approaching Vancouver. The packages would then be retrieved from the water and taken ashore by small boats. To stop this practice, flying-boats were sent out to meet the large liners when they were about two hours out and escorted them in to port, keeping a careful watch for any signs of attempts at smuggling. Suspicious looking craft in the vicinity of the liners were stopped and their papers examined by the customs inspector carried on the flying-boat. The patrols had a striking moral effect as small craft gave incoming steamers a very wide berth; other evidence of the efficacy of the patrols was an abnormal rise in the prices of drugs on the Vancouver market, some supplies which had previously been sent to Seattle being returned to Vancouver to gain the higher profit.

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(12) Col. Rogers wrote: "...it appears almost incredible that one could have covered such enormous distances in so short a time and with such absolute comfort and enjoyment."
(13) Ibid.; Appendix 8.

Similar patrols were also flown for the prevention of illegal fishing, and aircraft were used in yet another novel experiment for the fisheries, the stocking of coastal waters. Several flights were made to carry fish eggs from hatcheries to places along the coast where they were placed in the water in specially-constructed boxes and left to be hatched. In this way it was found possible to plant eyed eggs in areas that had previously been inaccessible because of the loss of time in moving the eggs from the hatcheries. Later in the year another experiment was made to see if it was possible to transfer fish eggs inland to the Harrison Lake hatchery without affecting their fecundity. Transportation by ordinary means, entailing rough handling on motor boats and trains, had caused much difficulty which it was hoped air transport would obviate.

While being used to help fish eggs to hatch, aircraft from Vancouver station were also used in a reverse experiment to keep mosquito larvae from maturing. On behalf of the Entomological Branch of the Department of the Interior which for two years had been trying unsuccessfully to locate and define the extensive mosquito breeding areas along the lower Fraser river by the use of auto, boat and foot, reconnaissance flights were made over the suspected areas. By direct observation and study of aerial photographs the entomologists were able to map accurately the limits of the regions where the pest originated.(14)

Aircraft were also used to assist the Geodetic Survey Branch of the Department of the Interior in establishing a primary triangulation scheme in British Columbia. The great problem in this work was to select basic points that were intervisible and accessible, a problem which, in wooded or mountainous terrain, required much laborious travel on foot. Through the use of aircraft for reconnaissance it was possible to cover in three months at least three times as much ground as had been done by any other method with a resultant major saving in expense; and the Survey "secured through one of the most rugged portions of the Dominion a primary system of triangulation which would be difficult to improve without increasing the cost of the ultimate survey beyond all reason." Mr. H.F. Lambart, in charge of the work, said that in future the aircraft was an absolute "sine qua non."(15)

The flying-boats at Vancouver carried homing pigeons on their flights with "excellent" results. On one occasion in December an HS2L was forced down by engine trouble off the mouth of the Fraser river. As a heavy sea was running, a pigeon was released with an S.O.S. message, and assistance was sent from the base in time to rescue the crew and ensure the safety of the aircraft.(16)

At the end of the operational season when snow, ice or heavy rains forced suspension of activities for the winter, the aircraft used on the stations were dismantled for inspection and overhaul. The aircraft situation was not encouraging. The machines had all been in use for some time and were obsolescent, not designed or well adapted for the work they were doing. At High River the DH4s showed much deterioration due to the rough

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(14) Ibid.; Appendix 10.
(15) Ibid.; Appendix 9.
(16) Air Board General Progress Report No. 10; p. 9. The pigeon loft was in charge of Alexander Dickie.

weather conditions they had to face. Deficiencies in the other two types in use at other stations, the HS2L and F3 flying-boats, were becoming increasingly apparent. Vancouver reported that although they were "in many respects..good machines," they were not designed for use in mountainous country. Their ceiling was limited to 6500 feet, with obvious disadvantages in using them in districts where there were peaks of 7000 to 10000 feet altitude. Lack of aircraft of a suitable type hampered operations and increased personnel risks to some degree.(17) But funds were not available for the purchase of modern aircraft to replace the obsolescent war types.

The operations carried out in 1921 had marked out the broad outline of civil government air operations through the next 15 years. The utility of aircraft had been demonstrated in many different fields for many branches of the government - forest reconnaissance and fire protection, photographic reconnaissance and survey for town planning, waterways development, land reclamation, boundary delimitation, and mapping, reconnaissance for geodetic triangulation, patrols for the suppression of smuggling and illegal fishing, and transportation and communication over unsettled, inaccessible regions. The Interdepartmental Conference which met in December 1921 was attended by representatives from eleven branches of the Department of the Interior, and delegates from six other departments and the R.C.M.P. The keen interest which they displayed "in the progress of aviation and its application to the practical field work of so many branches of the Government service was exceedingly helpful and encouraging...."(18) Enthusiasm, however, was countered by chilling financial restrictions which permitted only a provisional programme for the 1922 season, pending clarification of the whole defence situation.

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(17) Air Board Report for 1921; p. 9.
(18) Air Board General Progress Report No. 10; p. 12.

C. Technical Services in 1921

Lt.-Col. Stedman's staff was engaged on five major tasks during the year - calculations to determine stability and strength of construction so as to ascertain the airworthiness of commercial aeroplanes; drafting of specifications, similar to those of British Engineering Standards, for all materials used in aircraft; inspection and testing of materials purchased by the Air Board for use at air stations; examination of aircraft and engines, and advice concerning defects, modifications, overhaul and repairs; and, it is particularly interesting to note, the design of a flying-boat adapted to conditions peculiar to Canada.

Research work continued in co-operation with the Associate Air Research Committee. Profs. Robb and MacKergo and Mr. Stanley Smith were still engaged on projects mentioned in 1920; Prof. Parkin of the University of Toronto was making further experiments with the wind tunnel, "an appliance for testing lift and resistance," while two of his colleagues, Profs. Bain and Gillespie, were investigating the storage of oil in cold weather, and the effects of low temperatures on aeroplane rigging. To determine the effect of weather upon doped fabric, samples were sent to different meteorological stations throughout Canada for exposure under various atmospheric conditions. The results obtained from these various studies were communicated to the Air Ministry and, unless confidential, to commercial organizations also.

When Capt. H.C. Craig, the Director of Equipment and Stores in the Air Board, resigned his office in the summer of 1921 his duties were transferred to Lt.-Col. Stedman who became Director of Technical and Supply Services. Early in 1922 Mr. S.G. Tackaberry, who had been air equipment officer at Camp Borden since September 1920, was transferred to headquarters in Ottawa and became Stedman's aide as Assistant Director of Stores, a post which he filled for the next 18 years.

Chapter VI

A. Air Board 1922

On 6 December 1921 a general election swept the Conservative-Unionist Government of Arthur Meighen out of office and a Liberal administration under the new leader W.L. Mackenzie King took over, with the Hon. George P. Graham holding the portfolio of Minister of Militia and Defence and Chairman of the Air Board. The change of government had a two-fold effect upon the Air Board. First, and most immediate, was an urgent need for the greatest economy because of the general depressed financial situation; second was the absorption, at the end of 1922, of the Air Board in a new Department of National Defence.(1)

Because of the financial crisis the Air Board estimates for the 1922-23 fiscal year were slashed by almost 40% to an even $1,000,000. This reduction meant that hopes of purchasing new aircraft to replace the obsolescent war types had to be deferred, as well as plans for instituting a scheme of university cadet training to infuse "new blood" into the Canadian Air Force. The $1,000,000 estimate, a provisional figure pending clarification of the situation when the new department came into being, was subdivided between air services (CAF and Flying Operations) $896,500, Control of Civil Aviation $8,500, grants for air research $2,500, salaries $75,000, and contingencies $17,500.

When Mr. Graham submitted the estimate on 12 May 1922 he told the House that, despite the decrease, it was hoped "to carry on all the civil aviation work we did last year", by asking the various departments of the federal government, as well as the provincial governments, to pay the cost of aerial operations carried out for them. Mr. Meighen, now leader of the opposition, agreed that the provinces should be assessed for the work done for them, but he could not see the value of collecting from other departments of the Dominion government the costs of services performed for them: "It will entail all sorts of bookkeeping and an additional cumbersome organization." When Mr. Graham replied that the militia estimates had been severely criticised for years past and he wanted to show the actual expenditures of his department, the leader of the opposition retaliated that "the only object (the minister) has in mind is to keep the defence estimates down, and thereby be able to show that the Government has kept its pledge."

Mr. Guthrie, the previous chairman of the Air Board, then took up the attack. Newspapers had proclaimed that the minister had performed "a wonderful service" by cutting the Air Board estimates, but it was merely camouflage; there was no indication of any reduction of work to be done, "no real cut in the estimate, no real reduction in the expense." In the two previous years the estimates had been pared down to modest, reasonable amounts, and

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(1) A few days after the election A/V/M Gwatkin wrote; "(the Liberals) are pledged to rigid economy; and what their attitude towards the C.A.F. will be, I do not know. I am a little afraid of an attempt being made to bring it under the Militia Council; but I am doing all I can to convince people that it should continue to be organized and administered as a third service - single, unified and separate." A.F.H.Q. file 601-4B-8.

all the work done for other departments had been charged to the Air Board. This year there was to be a change in method, but no change in result, and by spreading the expenditure over several departments the public would not know what the Air Board was costing: "it should all be in the estimates." When Mr. Graham interjected that it would be, Mr. Guthrie replied that either the minister's information was very misleading, "or I am very dense." The staff of the Air Board was to be the same and operations, it had been stated, would be continued as in previous years; yet the estimate was a cut of 33% which would seem to mean that air operations would be cut by at least one-third.

For almost an hour Mr. Guthrie and Mr. Meighen continued to press the minister for a statement of the actual cost of the air service: "you are not cutting it down except on paper...you are trying to camouflage the expenditure." Their badgering was of little avail. Mr. Graham insisted that expense was being cut in every quarter, without interfering with the special service of the organization. He believed that when the new Department of National Defence was organized it would be possible to perform "the essential service" at much less expense than the previous year, but no details could be given because the organization was not complete. Mr. Meighen rejected the excuse: if department officials had not decided how they intended to use the money, they were not prepared to ask for a vote. The minister was "simply asking for a blank cheque." Mr. Guthrie agreed: the people's representatives were deliberating an item for $1,000,000 and no one except the minister knew what was to be done with it. "I never saw a more blank vote asked for...." Mr. Meighen's final effort to obtain details of services to be continued, reduced or cancelled elicited only a statement by the minister of sums spent the previous year. Resignedly, the leader of the opposition said "that is all the information we are going to get," and the item was agreed to.(2)

During the debate it was intimated that any reduction in the air service would affect the military rather than the civil side. Mr. Graham remarked that there was little or no flying training being done at Camp Borden,(3) but the camp would be opened up a little later, although probably not to the same extent as in the past. Mr. Sutherland expressed concern over this situation. "As far as I can understand from the minister's explanation, the Air Force, as a defensive force, is practically going to cease to exist." The other military services were also being cut down, and only the Boy Scout movement was being kept up. "Is it possible that the people of this country are going to depend on our boy scouts as a body of national defence in the future?" Most people were inclined to underestimate the Air Service, but it was most important and essential that a number of highly trained airmen should be retained, "so that this country might benefit from the valuable experiences which they have gained from the services which they rendered to Canada, instead of allowing this to become purely a civil force."

To this charge Mr. Graham replied that the majority of people complained he was making the air service "all military and not leaving any civil force." The work of the airmen in civil aviation, he believed, gave them "possibly the best training they can get"; they were really training for defence

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(2) Hansard, 1922 Session; Vol. II, pp. 1722-35.
(3) The "refresher" training scheme had been suspended at the end of March 1922.

purposes. But Mr. Sutherland was not satisfied. "...The minister has not denied the fact that it is becoming a civil force and is no longer a part of the national defence force at all. Why should men who are acting as fire rangers throughout the country be listed as part of the defence forces?..... If national defence in the future is to consist of an air force for forest ranging and the detection of smugglers, I think the House should know it..." National defence had an entirely different meaning from civil aviation;(4) an air force would be a tremendously important factor in defence in the future and the minister should treat the subject more seriously.(5) After the main Air Board estimate had been passed, a supplementary item of $5,000 was submitted to assist the University of Toronto in the construction of a new building to house the wind tunnel which had been used for some years for experiments in aeronautical research that had been of great value to the Air Board.(6)

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(4) "...It seems to me that you are dragging the service into the mire when you utilize it to detect smugglers and forest fires."
(5) Ibid.
(6) Ibid.; Vol. IV, p. 3499 (24 June 1922).

B. Flying Operations in 1922

When the Inter-Departmental Conference met in January 1922 to draw up a programme of flying operations for the 1922 season it agreed to continue and extend the work done the previous year in forest patrol and survey, photographic reconnaissance, preventive patrols, and transportation. Once again operations, chiefly in forest fire patrol, would be carried out on repayment for the provinces of Quebec, Ontario and British Columbia.

One significant feature of the programme was a great increase in the demands for aerial photography for many purposes - forest survey, geodetic survey, topographical survey, and water conservation. Following up some preliminary work done the previous year, the Conference planned a large-scale operation in Alberta to make mosaics of the principal streams flowing east from the Rockies to the settled prairie country. The conservation of water supply on the prairies and the extension of irrigation facilities being of such great importance, all the branches concerned were agreed that aerial photography could provide detailed information about the streams which could only be obtained otherwise by intensive ground work, involving large field parties and considerable expense.(1)

Despite the reduction in the Air Board estimate for that year, the Flying Operations Branch was able to carry out the major part of the programme, and the total volume of flying even exceeded that for the previous year by almost 600 hours. Forest protection, reconnaissance and photography were still the major civil government task, accounting for over half of the flights and more than three-quarters of the flying-time. The results were "even better" than in previous years. In addition to their obvious value in detecting forest fires more quickly and accurately than was possible by ground lookout stations, and in transporting fire fighters to the scene, aircraft had also proven their value in forest reconnaissance, or "timber cruising", to prepare maps of forest types, locate areas of destruction and new growth, and assess the amount of merchantable timber in specific areas. Canada's timber resources - her second greatest industry - lay for the most part in remote, inaccessible, uninhabited and very extensive regions where the preliminary reconnaissance could be done most economically and most efficiently from the air.(2)

Flying operations were carried out during the year from nine bases - Vancouver (Jericho Beach), High River, Victoria Beach and its sub-stations at Norway House and The Pas, Ottawa (Rockcliffe), Roberval, and Whitney and Parry Sound, which had replaced the Northern Ontario Mobile Unit. Dartmouth was still in use as a repair base, but did relatively little flying. High

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(1) The Conference also recognized the importance of aerial operations in the Mackenzie basin where communications were poor and distances great - "there is no more useful field for operations than in that district"; finances, however, did not permit an extension of the Air Board's operations into that territory in 1922. See Air Board Report for 1922; pp. 31-32.

(2) "Report on the use of Aircraft in Forest Protection" by D.R. Cameron, B.A., B.Sc.F, (M.Sc.) Dominion Forestry Branch, Dept. of the Interior; Appendix No. 2 to Air Board Report for 1922; pp. 70-75.

River was the most active station, doing more than one-third of the year's flying. A staff of 112 men (pilots, air engineers and mechanics) and a fleet of 29 aircraft were employed on flying operations, which totalled about 1200 flights for almost 2800 hours. There were two fatal flying accidents in which two pilots and a passenger were killed.

When originally opened in 1920 the air station at Jericho Beach consisted only of some canvas Bessonneau hangars, a concrete platform and a slipway. The temporary canvas hangars deteriorated rapidly in the damp climate of the Pacific coast and a permanent steel and wood hangar was erected to replace them. A permanent 5,000-gallon fuel tank was also installed. During the year the station, with a staff of 20 and five flying boats, made 176 flights for a total of 304.33 hours.

About one-third of the flying was on forest fire protection for the provincial Government during June, July and August when the fire hazard was high due to unusually dry weather. Because of the extremely hazardous situation a proclamation was issued on 9 July instructing logging operators to cease work temporarily, and aircraft were used to drop copies of the proclamation so that more than 1,000 logging camps could be notified without delay. Regular daily patrols could not be made, but aircraft were sent out whenever required for detection, inspection, fire-fighting or general supervision of the suppression work. On one inspection trip twelve new fires were located.

One of the major feats of the season was the use of aircraft in combatting a fire that broke out at Buttles Lake, in the centre of Vancouver Island, late in July. To reach the scene by land would have required a two - day trip and the construction of about 14 miles of trail over difficult country, but aircraft made such a laborious procedure unnecessary. An F3 flying-boat picked up four fire-fighters, together with their equipment,(3) and flew them to the lake where they were put ashore in collapsible boats. The flying-boat then made a second trip to bring in three more fire-fighters. By the next morning the fire was practically under control. Some days later the F3 returned to the lake to bring out the fire-fighters and their equipment, twelve passengers being transported at one time in addition to the crew. In all, during the season, 45 men were flown to various fires.(4)

Preventive patrols for the suppression of smuggling were continued, 27 flights being made between 6 April and 6 October, and about the same amount of flying was done for the Department of Agriculture in an investigation of white pine blister rust. The blight had been discovered the previous autumn, following which a field party led by Mr. A.T. Davidson was sent to examine the situation. The Air Board was asked to assist in the work and E.L. MacLeod and A.T.N. Cowley, two of the station's pilots, made reconnaissance flights, totalling 61 hours, to carry members of the field party and three American scientists to infected areas along the coast of the mainland and Vancouver Island. Thanks to

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(3) A portable pump, 1200 feet of hose, tools, tents, provisions, etc. - a total load of 4,895 pounds.
(4) The province repaid $4,824.63 of the cost of these operations, and commercial firms paid $733.20 for several small but important flights undertaken for them when the forest fire situation was at its worst.

the "very considerable aid" given by the station the small field party was able to reach many remote, almost inaccessible places and cover more territory than had been anticipated. One most important discovery was made late in the 1922 season when the blight was detected in the interior pine belt at Revelstoke and other points. Thanks to this timely aerial reconnaissance a whole season was gained for the Canadian authorities and also for the American federal and state Governments whose pine stands in Idaho and eastern Washington were menaced.(5)

The use of aircraft in the Geodetic Survey's triangulation work, which had started at Vancouver the previous year, was continued in 1922. Eight flights (21 hours) were made between 7 June and 8 July to transport a party engaged in the preparation of primary geodetic stations along the Fraser River valley. Thanks to the time saved in reaching sites otherwise difficult of access, the party was able to complete its work as far as Kamloops in one very short season.(6)

Extremely poor flying weather and the limited visibility due to smoke from forest fires greatly restricted photographic work until late in August. When conditions improved, some progress was made on tasks for the Geological Survey and other branches, including a mosaic of the Fraser River valley in the Nicomen Island district to show the state of the Sumas reclamation work.

S/L C. MacLaurin, who had been air station superintendent at Jericho Beach since its opening, was killed in a flying accident on 11 September. Accompanied by a passenger, Mr. J.R. Duncan, and a mechanic, MacLaurin had taken off for a flight to the Sumas reclamation site when a leak was discovered in the gas tank of the flying-boat. As the pilot turned back to land, the HS2L suddenly nose-dived and crashed into shallow water about 200 yards from shore. MacLaurin was drowned and the passenger received fatal injuries; the mechanic escaped with a sprained ankle. "Major MacLaurin's death was a great loss not only to the Government service but to aviation generally. He was one of the first six pilots to proceed overseas from Canada to the Royal Naval Air Service. He had a brilliant war record and was a pioneer in the development of the civil use of aircraft in Canada. No one had done more to open up new fields for aviation. His work on the British Columbia coast in developing the new form of transportation was uniformly sound."(7) S/L A.E. Godfrey replaced MacLaurin as superintendent at Jericho Beach on 18 October 1922 and continued as CO when the station became CAF Unit, Vancouver, on 25 November.

During the year Vancouver was visited by several aviators who were planning long-distance flights. One was Col. L.E. Broome who was making arrangements for a round-the-world flight proposed by Major W.T. Blake.(7a) Another visitor in May 1922

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(5) See A.F.H.Q. file 1008-17-2.
(6) A.F.G.Q. file 1008-2-5.
(7) Air Board Report for 1922; p. 36.
(7a) Blake proposed using relays of four aircraft, including a DH9 for the eastward flight across Canada from Vancouver, and a F3 for the trans-Atlantic flight from St. John's; the Air Board offered assistance in erecting the flying-boat at Halifax. Blake's flight got under way in May and reached Chittagong, India, before it had to be abandoned. The DH9 which had been shipped to [illegible] sold to a Canadian company. See AFHQ

was Captain Roald Amundsen who was preparing an expedition to the North Pole on which he intended to use aircraft. He was greatly impressed by a collapsible boat used at the station, which he considered the best he had seen, and S/L MacLaurin presented him with one of the canoes and six homing pigeons. The explorer also secured the services of F/L E.G. Fullerton, one of the pilots at Vancouver, who took a year's leave to accompany Amundsen as pilot navigator on the expedition. The explorer's plan was to sail from Seattle on the "Maud" early in June, carrying two aircraft, a Curtiss "Oriole" and a Junkers monoplane. After the expedition left Point Barrow, the aircraft would be used to reconnoitre ahead of the ship and to lay down a petrol cache some 500 miles out on the ice floes. Accompanied by Fullerton and Lt. Oscar Omdal, Amundsen then proposed to fly the Junkers to the North Pole, and land there if possible before continuing to the east coast of Greenland. It was expected to complete the 1600-mile flight in 20 hours; sufficient gasoline would be carried for 26 hours flying and four days emergency rations. In case of a forced landing on open sea Fullerton had the wings of the aircraft filled with 500 inflated pigs' bladders; the collapsible canoe would be used for crossing openings in ice floes if they were forced down on the ice cap. Despite the careful planning, however, the flight did not materialize.(8)

At High River, as at Jericho Beach, the canvas hangars originally in use had now been replaced by more permanent wooden structures with concrete foundations; suitable work-shops and storehouses had also been built. A good system of communications was in service, using wireless telephone to link the station with aircraft on patrol and ground telephone between the station and forest ranger posts. Under S/L G.M. Croil, the air station superintendent, there was a staff of 28 pilots, mechanics and other employees, including F/Ls A. Carter, G.R. Howsam, A.A. Leitch and J.H. Tudhope. Operations began on 28 April and continued until the end of the year, 267 flights being made for a total of 1075.45 hours - a record which placed High River far ahead of the other air stations and constituted over one-third of the total civil government flying.

Forest fire patrol accounted for more than three-quarters of the station's work (194 flights of over 900 hours). The patrol area was divided into two sections and, to increase the efficiency of the service, a landing-ground was laid out at the terminus of each section, Eckville in the north and Pincher Creek in the south. In the morning an aircraft left High River to patrol each section, landed at the sub-base to refuel, and made a return flight to High River in the afternoon. The aircraft used were DH4s, modified as single-seaters and fitted with wireless telephone sets. Despite their age they were still giving "excellent service", no mechanical trouble of any kind being experienced. In three years of operation, from Morley and High River, there had not been one forced landing, a most important consideration in an area "where the terrain is rough and safe landing grounds are few and far between."

In addition to the single-seater forest patrol aircraft the station also had a specially equipped photographic de Havilland with which a large programme of work was completed. The major task was to compile a complete photographic record of the more

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(8) A.F.H.Q. file 1008-1-1.

important streams rising in the eastern slopes of the Rockies, for the use of the Reclamation Service of the Department of the Interior in preparing plans for water conservation and irrigation. Another operation involved photography of various mountain areas to obtain topographical detail which the Topographical Surveys Branch required to complete its work. Photographs were also taken of the Bow River drainage basin for the use of the Water Powers Branch, and a mosaic was made of the Banff town area for the National Parks Branch.

Reconnaissance flights were made for the International Joint Commission to examine streams in the southwestern part of Alberta, and for the Geodetic Survey Branch to assist its primary triangulation work along the line of the continental watershed from Yellowhead Pass northwest to the intersection of the 120th meridian at Jarvis Pass. Encouraged by the results of some preliminary work in this field in British Columbia the previous year, Mr. H.F. Lambart, the officer in charge of the triangulation work, arranged with Major Croil for a series of flights from Jasper over the area where his crews would be working. Mr. A.O. Wheeler, a member of the Interprovincial Boundary Commission which was marking the boundary between British Columbia and Alberta, was also anxious to fly over the area to see "What lies beyond the watershed." Much of the area was still unmapped and relatively unknown.

After a DH4 had been modified for the purpose, Capt. J.H. Tudhope flew it from High River to Edmonton where he refuelled at "May aerodrome" before turning west towards Jasper Park. A landing was made at Henry House, nine miles east of Jasper, where park officials had lit a smudge fire to indicate the landing-field. Mr. Wheeler was given a brief flight on 12 July and a much longer one on the 13th which made him most enthusiastic about the use of aircraft for mountain reconnaissance; "... it is, to a topographer, a study of a living map, the most accurate that can possibly be had."(9) For the next two days the weather was bad; a sudden cyclone on the 15th blew down the tent at the landing-field, almost overturning the aircraft. On the 16th, however, the weather was ideal and Tudhope took Lambart for a long four-hour flight which covered the whole course of his survey along the watershed to the 120th meridian. Mr. Lambart gained information that was "far-reaching" and he also took a series of 24 photographs before a jammed magazine prevented further exposures. On the return flight to Henry House a bag of mail was dropped at one of the survey camps, and a forest fire was detected and reported to the park superintendent. Photographic work at the landing-field was hampered by the fine sand and dust which covered everything and even filtered through the blankets; nor was a "changing bag" a very convenient method for inserting plates in the camera. There being no planks or boxes available for use as a table, Tudhope had to sit on the ground with the bag between his knees, and his hands began to perspire as soon as he put them in the bag. It was intended to make further flights but smoke from the forest fires filled the valleys and, with no prospect of an early improvement, Tudhope returned to High River on the 18th, the poor visibility forcing him down to 500 feet above the railroad tracks at some points along the route.

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(9) Mr. Wheeler wrote an article describing his experiences.

Commenting on his flights, Mr. Lambart pointed out that in less than four hours' flying time he had covered about 450 miles; a pack train starting from the nearest point on the railway would take 14 days of actual travel to reach Jarvis Pass. In addition to this saving in time and energy, aircraft would also eliminate the need for extensive reconnaissance on foot over hitherto unmapped territory, while the photographs would supply much information to the survey parties and "act as a valuable guide" on the conditions to be met as the work proceeded. Furthermore, the survey season was very short - about 13 weeks - so aircraft could render very valuable assistance in making the maximum use of the time available. From the air it was possible to see the general configuration of the terrain, pick out the best lines of travel, and select stations which would give the best scheme of triangulation.(10)

Operations in the Manitoba area, which had been started from Victoria Beach in the summer of 1921, were extended in 1922 to include two sub-bases at Norway House and The Pas. The Norway House sub-base, at the northeastern corner of Lake Winnipeg, was located on Forestry Island in an expansion of the Nelson River about 35 miles from the lake. At The Pas the aircraft operated from the waters of the Saskatchewan River. Working through a full season from mid-May to mid-October, S/L Hobbs and his staff of 37 made 158 flights for a total of 324.46 hours, an increase of about 75% over the previous year.

As in the case of High River, more than three-quarters of the flying from Victoria Beach, Norway House and The Pas was done for the Forestry Branch of the Department of the Interior, to keep watch over the vast forest areas surrounding Lakes Winnipeg, Manitoba and Winnipegosis. Great difficulties had to be overcome in maintaining the service, principally due to the fact that the only aircraft available for long distance operations was the large twin-engined F3 flying-boat which had "always been difficult to operate." The lack of ground facilities such as workshops, slipways and hangars, and the limited number of protected anchorages suitable for refuelling, put so great a burden on the small staff that "only by the most strenuous efforts" were the machines kept in the air. There was urgent need for more modern types, smaller and easier to handle, to carry on the work in these isolated areas. Nevertheless, despite inadequate aircraft and equipment, much useful work was done in detecting fires and checking them before they could spread. The Royal Canadian Corps of Signals had erected a wireless station at Winnipeg to maintain constant communication between forestry headquarters and the district fire officers in the field; in the following year it was expected that the aircraft also would be equipped with wireless.

In addition to, or often as part of, the forestry patrols much transportation flying was done, which illustrated in a striking manner the usefulness of aircraft in regions where ground travel was so slow and laborious. On one series of flights through June, July and August a distance of 3000 miles was covered in less than 47 hours, carrying agents of the Department of Indian Affairs who were paying treaty money in the Clandeboye and Norway House agencies. The points visited during the flights included Fort Alexander, Black River, Hollow River, Berens River, Deer River, Pekangekum, Grand Rapids, George's Island, Bloodvein Reserve, Cross Lake, Oxford Lake,

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(10) See A.F.H.Q. file 1008-2-5.

God's Lake, Island Lake and Thunder Lake. The risks involved in operations in these relatively unexplored areas were illustrated on one occasion when the flying-boat, taking off from uncharted and unknown waters, hit a submerged rock and was severely damaged. An Indian chief and his band who were living nearby rendered valuable assistance in saving the machine and making repairs. Another aircraft was flown in to help, and after three weeks' work under the most primitive conditions the repairs were completed. Anxious to extend these treaty money flights to other remote districts, the Department of Indian Affairs agreed to pay the costs from their own appropriation.

Another long distance flight was made to enable Mr. Narraway, controller of surveys in the Topographical Surveys Branch of the Department of the Interior, to inspect his survey parties in the field. In 14 hours flying time spread over ten days, six of which were spent at camps, Mr. Narraway was able to cover a route from Victoria Beach to Churchill River, northwest of The Pas, that would have required practically the whole season by ordinary methods of travel.

During his air trip Mr. Narraway experimented with oblique photography over the course of the survey between The Pas and Churchill River. More photographic work was done on other flights, including a long strip along the Manitoba-Ontario boundary north from the Winnipeg River, and the various falls and rapids along that river from Lake Winnipeg to Lac du Bonnet. Aircraft were also used to fly mail and supplies in to survey parties and to transport surveyors to and from the scene of their operations.

Impressed by the forestry work accomplished by the mobile unit based at Sioux Lookout in 1921, the Ontario government asked for a more extensive operation in 1922, for which it agreed to bear the cost. To provide bases for patrols over a forest area of 10,000 square miles between Parry Sound, North Bay, Pembroke and Haliburton, two suitable flying-boat anchorages were selected at Whitney and Parry Sound, moorings were laid, and temporary accommodation was arranged for personnel, stores and equipment. On 23 May two HS2Ls were flown up to Whitney from Ottawa; two Avro 504 floatplanes were also used during the summer as an experiment to determine the suitability of the smaller type for this work. F/L C. McEwen was in charge of the two bases with a staff of three pilots and ten other personnel.

From the end of May to early October daily patrols were flown over the Algonquin Park area. In a period of 134 days, of which only seven were completely washed out, the aircraft made 299 flights for a total of 616.37 hours, a record that was surpassed only by High River air station. The great bulk of the work (about two-thirds) was done from Whitney. As wireless was not carried on the aircraft the crew, when they discovered a fire, had to land at a ranger station, drop a message "to the nearest dependable assistance", or report it by telegraph on their return to base. Eighty-four fires were reported during the season, and on at least one occasion aircraft flew additional equipment to a site where four fires were threatening to get out of control. The Ontario district forester, who worked in close co-operation with the air staff, reported at the end of the season that "the results exceeded the most sanguine hopes of the

promoters of the scheme."(11)

For the third successive year the Air Board co-operated with the Quebec government in carrying out forestry reconnaissance from Roberval. This year, however, the station was not opened until 29 June, a month later than usual, because of delays in reaching agreement on the terms of operation; the provincial government ultimately agreed to expend not more than $20,000 on the work. Capt. W.R. Kenny was once again in charge as air station superintendent, with a staff of 17 which included F/Os L.R. Charron, B.De Salaberry and A.L. Morfee. Despite the late start, the station was able to surpass its 1921 record by making 187 flights for a total of 297½ hours in a period of four months.

As the area for which detailed forest information was required this season lay some 100 miles northwest of Roberval, a sub-base was established on Stacker Lake where there was "an admirable landing place with suitable sheltered anchorages." To maintain the aircraft and staff at the sub-base it was necessary to transport considerable quantities of gasoline, oil, stores and food over a route that required five days' travel by canoe. One of the station's three HS2Ls was therefore employed continuously on transportation of supplies, while the other two carried out the survey work. Operations were extended as far as Lake Mistassini through the use of gasoline caches laid down at Fileaxe and Rat Lakes. Provincial forestry officers, who flew as observers on the aircraft, made sketch maps which were supplemented by 2300 oblique and vertical photographs.

In addition to the major activity in the Roberval-Mistassini area some detached operations were carried out along the north shore of the St. Lawrence to survey the forest resources in the basins of the St. Marguerite and Natashquan rivers. A flying-boat which had been sent from Halifax to Anticosti Island had engine trouble en route to Natashquan. A second HS2L was therefore dispatched from Roberval at the end of August and flew down the Saguenay and along the St. Lawrence, via Ellis Bay on Anticosti, to Natashquan. During the first three weeks of September the crew made thirteen flights along the coast from Natashquan westward to the Godbout river, while the forestry engineer made sketches and preliminary maps. On the north shore of the St. Lawrence flying conditions were difficult because sheltered harbours were few and weather conditions uncertain; farther inland more suitable landing places were to be found on the numerous lakes and rivers.

Because of weather conditions and the lateness of the season the crew of the HS2L set out to return to base on 21 September. As the sheltered harbour did not have sufficient space for take-off, the pilot tried to start from the open waters of the gulf, but an exceptionally large wave struck the aircraft as it was taxying to gain flying speed, damaging it so badly that it

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(11) Air Board Report for 1922; p. 44. The provincial government repaid $38,909.23 of the cost of the operations. On termination of the patrols on 4 October the HS2Ls were flown back to Ottawa for overhaul during the winter and the Avros were sent to Camp Borden. The staff of the two bases returned to Ottawa to spend the winter working on the overhaul and repair of aircraft and engines.

sank before it could be beached. A motor launch rescued the crew who returned to Quebec by boat, bringing with them their equipment, notes, photographs, maps and sketches. Despite the accident the expedition was regarded as a success. It had demonstrated that, given adequate equipment and proper preparation, the use of aircraft for preliminary reconnaissance of unknown territory was both economical and quick.(12)

When ice formed on the lakes towards the end of October operations ceased at Roberval; the flying-boats were dismantled, and the engines and other equipment which needed overhaul were shipped to Ottawa and Camp Borden to be repaired during the winter months. This season marked the end of Air Board operations at Roberval. In 1923 the station was taken over by the Dominion Aerial Exploration Company, headed by Capt. H.S. Quigley, M.C., D.C.M., which worked under contract for the Quebec government.

At Ottawa air station (Rockcliffe) the only facilities were a small storehouse and a Bessonneau hangar, the canvas cover of which was replaced in the spring of 1922 by wooden sheathing and roofing material to provide more adequate shelter. As workshop facilities were non-existent and the station was difficult of access during the winter it was necessary to find accommodation elsewhere for the overhaul and repair of aircraft. At first the aircraft were sent to Camp Borden for storage when operations ceased at Rockcliffe. Then, in the winter of 1921-22, temporary quarters for overhaul and storage were leased in a building at 362 Sparks street in Ottawa. In the summer of 1922 a search for more suitable premises resulted in the acquisition, through arrangement with the Department of Public Works, of space in the government shipyard on Victoria Island in the Ottawa river. Facilities there were "admirable" for work on seaplanes. The aircraft could be landed on the river close to the island, drawn ashore on a slipway, and then dismantled close to permanent stone buildings which provided shop, storage and office accommodation where work could be carried on "under excellent conditions." From the winter of 1922 on for many years aircraft used on operations in eastern Canada were flown back to Ottawa at the end of the season to be overhauled at the depot on Victoria Island during the winter months; in the spring they were launched down the slipway and flown directly to the bases where they were required.

Operations carried out from Ottawa air station during the 1922 season (21 April to 19 November) totalled 107 flights for 133½ hours, almost one-half of the flying being for various kinds of experiment and testing. Experiments in the development of wireless telephony for aircraft, which at first had been hampered by the problem of eliminating engine noise, had finally attained success and in September a demonstration was held at the station, in co-operation with the Royal Canadian Corps of Signals, to show the use of this means of communications on forest fire patrols. Before a representative gathering of engineers, foresters and lumbermen, two-way wireless telephone communication was established between a flying-boat and a main

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(12) "Information, which would otherwise be obtainable only by the equipment of large ground parties, can be obtained with ease and certainty at a minimum cost, both of time and money, by the use of aircraft." Air Board Report for 1922; p. 47. Quebec once again paid $20,000 towards the cost of the operations from Roberval.

ground station. Messages were passed clearly, and instructions to the aircraft were obeyed "with ease and certainty." A small receiving station which was set up some distance away to represent a fire rangers base was able to hear speech from the flying-boat clearly while it was flying at a considerable height and distance.

Photography was still a major commitment at Rockcliffe. Further experimental work was done on the development of Prof. H.L. Cooke's aerial survey camera, and also on the development of techniques for making maps from oblique photographs.(13) Some photographic tasks were undertaken in the Lievre and Gatineau valleys for the National Parks Branch.

Another photographic operation planned for London, Ont., ended in a fatal crash. Examination of the photographs taken by Capt. Holland and Lt. Owen in the spring of 1921 showed a few gaps in the mosaic of the city and the Geodetic Survey Branch asked for some further flights in the spring of 1922 to complete the task. En route from Camp Borden to London, on 23 April, the DH4 crashed near Brantford; Capt. Holland was killed and Lt. Owen was seriously injured. Before arrangements could be completed to send another aircraft and crew, the leaves had come out on the trees and the operation was postponed until the fall. Early in November, F/L R.S. Grandy and Sgt. A.J. Le Sueur flew a Bristol Fighter from Camp Borden to London and exposed five rolls of negatives.(14)

After Capt. Holland's death, S/L A.E. Godfrey held the appointment of air station superintendent at Ottawa from 12 July until mid-October when he was transferred to Vancouver. F/L C. McEwen, who had just returned to Ottawa from summer operations at Whitney, then became superintendent (14 October). The small staff numbered only 18. The Air Board designation "Ottawa Air Station" ceased on 25 November 1922 when it became "C.A.F. Unit, Ottawa".

Dartmouth still served primarily as an erection and repair base for seaplanes. Little flying was done there, only 16 flights being recorded in 1922 for a total of about 32 hours. One of the flights was a preventive patrol - the first carried out on the east coast. For the Water Powers Branch of the Department of the Interior a photographic operation was attempted, to cover the watersheds of the Roseway, Bear and East Rivers and the hydro-electric development at Musquash and St. Margaret's Bay. The work did not begin until late in the season when poor light and uncertain weather prevented completion of the task.

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(13) Appendix No. 1 to the Air Board Report for 1922 (pp. 56-69) gives a brief summary of aerial photographic operations carried out for the Topographical Surveys Branch, a report on plotting topography from oblique aeroplane photographs, and a report by Prof. Cooke on experimental topographical survey from the air.
(14) The Director of the Geodetic Survey commented that the photographs "constitute perfect work by the officers concerned. Each flight is practically a perfectly straight line, and overlaps the next flight one third. The photos also overlap each other one third. The officers who took this set of air photos are to be congratulated upon the accuracy of their work and the skill with which it was carried out." AFHQ file 1008-2-5.

Under S/L Shearer, the station superintendent, there was a care and maintenance party of eight men. The storehouse and barracks which had been erected at Baker's Point in 1918 were still in good condition, but the hangar was only a temporary structure, and the wooden slipways and launching platform were rapidly deteriorating under exposure to the weather. More adequate facilities would be needed if the station was to remain in use.

Arctic expedition 1922

When the Canadian Government ship "Arctic" was being prepared in the spring of 1922 for an expedition to the Arctic archipelago to establish police posts in the far north and explore the country, the Department of the Interior requested the co-operation of the Air Board in an investigation of the possible use of aircraft for preliminary exploration and mapping and for inter-communication between the police posts. As it seemed useless to send any aircraft or equipment, or attempt any flying, until a thorough investigation had been made of the climatic and natural conditions, it was decided to send "an experienced flying officer, well qualified in meteorology and navigation", to examine flying possibilities in the districts visited. S/L R.A. Logan of the Canadian Air Force was selected as specially qualified for this mission. Prior to the war he had been a Dominion Land Surveyor and had had experience in northern Canada. He had been one of the first recruits accepted in Canada for the Royal Flying Corps in 1915 and, after training at the Curtiss Aviation School in Toronto, had served with the RFC in France until taken prisoner in the spring of 1917. After the war Logan had made a study of meteorology, aerial navigation and wireless, and since the fall of 1920 he had been in charge of the CAF's Ground Instruction School at Camp Borden where his work had won commendation.

The "Arctic" sailed from Quebec on 18 July and visited the north end of Baffin Land, Bylot Island, Ellesmere Island and North Devon Island before returning to Quebec on 2 October. At each of the places visited, S/L Logan made a careful examination of the terrain and weather conditions and marked out possible landing sites at Craig Harbour on Ellesmere Island and Pond's Inlet on Baffin Land. On 29 August 1922, while at Ellesmere Island he raised the CAF ensign in the "Land of the midnight sun"; the location - 76° 12' north latitude - was only 828 nautical miles from the North Pole, the farthest north reached by the Air Force for many years.

On his return to Ottawa S/L Logan prepared a comprehensive report on his investigations in the Arctic archipelago which contained many valuable suggestions and comments that are as applicable today as they were 35 years ago.(15) One passage will illustrate the range of his vision.

".... The development of Arctic and sub-Arctic flying is of the greatest importance, not to Canada alone, but to the British Empire as a whole..... Aircraft operated from Arctic or sub-Arctic bases (could) swoop down and leave trails of destruction throughout the rest of the world, but from the very

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(15) See Dunbar and Greenaway, "Arctic Canada from the Air";

nature of their bases of operation they would be almost inaccessible to aircraft of countries to which "cold weather" flying was unfamiliar. It is generally agreed that the best method of defence from aircraft is to destroy the enemy's aircraft before it leaves its own borders. Whether war with such a country as Russia would ever come or not, should not affect the determination to develop flying in the Canadian Arctic and sub-Arctic regions because Canada, if it considers itself worthy to be called a Nation, should have enough pride and spirit to take at least ordinary precautions and be prepared to defend itself in any emergency." (16)

In his excellent report Logan gave a most complete picture of the situation in the archipelago. He described the terrain, its inhabitants, climatic and ice conditions, suggested the uses of aircraft in the far north and the types most suitable to meet special conditions there, outlined the ground equipment necessary to overcome difficulties, and examined questions of transportation, fuel, food, clothing and other supplies. If the government decided to proceed with the exploration programme, Logan recommended that a small detachment of four men and two small aircraft should be sent to the north end of Baffin Land to spend a whole year there, flying every day that weather permitted, compiling meteorological and other data, observing flying conditions generally, examining the nature of landing grounds, and studying the possibility of aerial photography throughout the year. He was confident from his own observations of the area that conditions would be suitable for the operation of aircraft during a fair proportion of the year.

The Air Board commented that, "while it would be idle not to recognize the difficulties of operation, there is no doubt that aircraft can facilitate the exploration and mapping of the Arctic. Experience in the settled portions of Canada shows that cold weather in itself is not an insurmountable difficulty .....There is no reason to suppose....that when the need arises, with special machines and precautions, aircraft cannot be operated to advantage in the Arctic regions of Canada."(17)

At the moment, however, there was no imperative need. The defence factor did not seem as important in 1922 as it was to be a generation later, and there was still more than enough work to keep the small Air Force fully occupied in unrolling the map of southern Canada without venturing into the far north. S/L Logan's report was PA'd until 20 years later when war again focussed attention on the north and the possibility of developing air routes through the Arctic.

Wireless communications

In 1921 arrangements had been made for the Royal Canadian Corps of Signals to take over the Air Board's wireless equipment, including the station at High River, and to expand the service into Manitoba. The Corps had already established a communication

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(16) "Report of Investigations on Aviation in the Arctic Archipelago carried out during the summer of 1922", by R.A. Logan, Squadron Leader, Canadian Air Force; pp. 2-3.

(17) Air Board Report for 1922; p. 51.

system between Camp Borden and Ottawa and through the 1922 season it operated the wireless station at High River as well as new stations at Winnipeg, Victoria Beach and Norway House. "Very remarkable results" were obtained in the development of wireless telephony, especially at High River where continuous communication between aircraft on patrol and the base was maintained over distances of 125 to 175 miles "with perfect results". One of the largest fires detected in Alberta that summer was reported by radio telephone when the aircraft was 190 miles away from its base. The use of wireless not only increased the efficiency of the forest patrol work, but also added to the safety of flying over the foothills as the pilot was able to report his position exactly in case of trouble. In one season's work the wireless service paid for itself many times over by the speed with which it passed information about forest fires, making it possible to extinguish them before they could spread out of control.

The inauguration of the Manitoba system, linking forestry headquarters in Winnipeg with the operational bases at Victoria Beach and Norway House, was also of inestimable benefit in providing cheap, reliable and instantaneous communication over unsettled territory where distances were very great and other means of communication slow and imperfect. Victoria Beach was also able to maintain wireless contact with High River, 790 miles away.(18)

Technical and equipment services

Through the years that the Air Board had been in operation, the original stock of war-type aircraft donated in 1919 had given "wonderful service."(19) At the close of 1922 some of them, after five years of continuous use, were still fit for further service; but all were now obsolescent, and if further progress was to be made in aviation, aircraft specially designed to meet operational conditions in northern Canada were essential.

The technical staff of the Air Board under Lt. Col. Stedman had been studying the problem of replacement aircraft and, in addition to preparing detailed specifications for aircraft types required for use under Canadian conditions, had prepared designs for converting the standard Avro 504 K trainer into a single-float seaplane with a stationary engine. Six Avros were subsequently modified as float-planes, fitted with a 180 h.p. Wolseley "Viper"

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(18) Air Board Report for 1922; p. 26, and Report of the Department of National Defence for the fiscal year ending 31 March 1923; p. 29.

(19) During the Air Board era from June 1919 to December 1922 certificates of registration had been issued for 121 government aircraft. By types they were:

Avro 504K	- 41	Curtiss HS2L	- 19	Fairey C.3	- 1
Avro 504L	- 3	Curtiss JN 4	- 10	Martinsyde F.6	- 1
Bristol Fighter	- 2	D.H.4	- 12	S.E.5a	- 12
Curtiss H.16	- 1	D.H.9a	- 11	Sopwith Snipe	- 1
		F.3	- 7		

A number of unregistered aircraft, principally Avros, were held [illegible] erection.

engine in lieu of the 130 h.p. Clerget rotary. The Avro "Viper" was intended for use as an economical light forest fire patrol machine, leaving the heavier aircraft, such as the F3 or HS2L, for transportation of firefighters and equipment when required.

So far as possible the repair and overhaul of aircraft and engines was being concentrated in the workshop at Camp Borden, where mechanics were posted from other stations for duty during the winter months. To ensure adequate inspection of material and workmanship an aircraft inspection department, separate from the actual workshops, was set up at Camp Borden early in 1922 under the direction of F/L A.L. Johnson. This was the beginning of an AID organization that was destined to expand as the years passed and to play an increasingly important role.

During the year the accounting procedure for all stores was changed to conform to RAF procedure, "so that if ever the units of the two forces are called out to work together, no confusion will result."(20)

The Associate Air Research Committee continued its collaboration with the Technical Services Branch in the investigation of winter flying problems on which Profs. Robb, McKergow, Bain, Gillespie and Parkin, and Mr. Stanley Smith were working; Mr. Gliddon of McGill University was studying the friction of runners on snow.

A serious threat to the research work arose during the year when alterations to the mechanical engineering laboratory at the University of Toronto made it impossible to continue use of the wind tunnel which had been built during the war by the Imperial Government and subsequently used for test and experiment by the university, the Associate Air Research Committee and the Air Board. As wind tunnel facilities were essential for aeronautical research the Air Board opened negotiations and reached an agreement whereby the university undertook to continue operation of the tunnel and make it available for the work of the CAF and the Committee if the government would provide $5,000 towards the cost of a new building in which to house it. An item for this amount was included in the supplementary estimates for 1922-23 and approved by parliament.

International recognition of the importance of the aeronautical work being done in Canada was given in the award of the Royal Aeronautical Society's Silver Medal for 1922 to W/C Stedman for his paper on "Some Technical Aspects of Aviation in Canada."

In its final report the Air Board paid tribute "to the energy and efficiency of the officers, men and employees of all classes" who had made its work possible. "The year has been one of doubt and uncertainty as to the future, inevitable during a period of reorganization. Most of the work in the field has been done from temporary bases, without permanent or adequate facilities. The aircraft available are obsolescent and in many cases of types unsuitable for the work in hand. To have achieved so much under these circumstances is a happy augury for the future and a proof of the high morale and esprit de corps of the service."(21)

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(20) Report of the Department of National Defence for the fiscal year ending 31 March 1923; p. 42.
(21) Air Board Report for 1922; p. 55.

Looking to the future, the Air Board sounded the theme of Canadian air policy through the next decade and more: "Air power, like sea power, to be effective and permanent, must be based on a sound economic development for peace uses. On any other basis its maintenance in Canada must be artificial and burdensome in time of peace. The opportunity exists here for sound development as in perhaps no other country. Every effort should be made to assist aviation not only as a reserve of strength for the CAF, but for the advantages its growth will bring to the community as a whole."(22)

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(22) Ibid; p. 52.

C. Canadian Air Force 1922

The close of the fiscal year on 31 March 1922 marked the end of one phase in the history of the military arm of the Air Board - the end of the experiment to maintain a military air force by means of one month's refresher training for its personnel every other year. Organized air units, apart from the Training Depot Station at Camp Borden, existed only on paper in the form of inactive squadrons which had nominal rolls but no aircraft or equipment. Indeed if it had been necessary to mobilize these paper squadrons there were no service aircraft available for them except for a handful of SE5 fighters and DH9 bombers, all of which were obsolescent and most of which were now unserviceable.

From the date of the first authorization of the Canadian Air Force on 18 February 1920 to the termination of the refresher training scheme on 31 March 1922, 1335 officers had been appointed to commissions and 1384 airmen enlisted in the CAF. More than half of the officers - about 750 - were members of the service in name only; they were not called up for the normal training period and performed no air force duty except for a few who served on courts of inquiry into flying accidents. Of the officers who did actually serve in the CAF, 475 served only for the training period of one month (or in a few cases a somewhat longer period); four officers completed two refresher courses before that training ended. There remained a group of about 110 whose service was extended beyond the normal training period for varying terms; many of these officers were civil servants employed in other branches of the Air Board who donned uniform for periods of service with the CAF, particularly during the winter months when civil government flying was suspended.

In the case of the airmen all those attested and enlisted were sent to Camp Borden for the normal training period; a number had their term of service extended, but for the great majority the termination of the training period was the end also of their effective service in the CAF.(1)

On completion of the training period at Camp Borden officers and airmen were, in most cases, granted leave without pay until the next period of duty. When inactive squadrons were formed in 1921 and 1922 some officers and airmen were posted to them; the others, surplus to the establishments of these units, were carried on provincial unattached lists maintained by the branches of the CAF Association.

The total flying time at Camp Borden during the period of this experiment in a "refresher training air force", from September 1920 to the end of March 1922, was 4408 hours. There were two fatal flying accidents during the time in which F/O LeRoyer and S/L Tailyour lost their lives. An airman was killed when struck by the blade of a propeller which he was swinging. Another officer died from injuries received in an auto accident.

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(1) Included among the airmen was a sergeant pilot, A.S. Higginbottom, who was the only N.C.O. pilot in the C.A.F. After completing the normal training period as a sergeant he was appointed to a commission.

The total numbers trained were 542 officers and 1191 airmen.(2)

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The change of government, the sharp reduction in the air estimates, and the proposal to amalgamate the Navy, Army and Air Force in one department introduced a period of transition and reorganization which, in the case of the CAF, lasted through the two years from 1 April 1922 to 1 April 1924. The experience of the nineteen months, September 1920 to March 1922, during which the CAF was a non-permanent, non-professional, purely training organization had exposed many defects and disadvantages. In brief, the experiment in maintaining an air force by a scheme of refresher training only meant that Canada had an air force in name but not in fact. Great difficulties had been encountered in trying to perform the normal administrative and instructional functions of the service by a non-permanent, frequently changing staff. Radical changes were necessary in the whole air service organization. It was decided "to make a beginning with the establishment of a permanent nucleus for the CAF which would serve as a foundation round which the non-permanent organization throughout the country could be built."(3)

Another major defect in the original plan for the CAF was that the service existed only to give refresher training. No new pilots had been trained since the armistice. If the service was not to "fade away" in time it was necessary to train a new generation of pilots to take over from those who had won their wings during the war. The idea that flying was an occupation "for which youth is an essential" was no longer as widely held as it had been a few years earlier, and experience had shown that in civil aviation pilots could continue flying almost indefinitely; nevertheless there was no doubt that in service aviation a fighting pilot should be not over 30 years of age. By this time (1922) the great majority of the pilots who had served during the war had settled down in civil life. They could no longer be counted on as a reserve to supply any emergent need for the CAF nor as a pool to meet the increasing demand for pilots in civil aviation. It was essential from both points of view to begin training a steady supply of young pilots.

After careful consideration officials of the Air Board decided that the best source of new pilots would be the engineering and science schools of the Canadian universities. A scheme was

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(2) The various courses were:

Officers' Short Course	(Flying)	- 413
Officers' Long Course	(Flying)	- 26
Officers' Short Course	(Ground)	- 77
Officers' Long Course	(Ground)	- 26
Total Officers		542
Airmen's Short Course		- 928
Airmen's Long Course		- 263
		1191

To these figures should probably be added 4 officers (3 on the short flying course and 1 on the long ground course) and 46 airmen (2 on the short course and 44 on the long course) who did not complete their courses until early in April 1922.

(3) Air Board Report for 1922; p. 10.

accordingly drafted to give such students a training course in aviation during their school vacations, and the authorities of the universities to whom the idea was submitted unanimously agreed to the principle and offered their support in carrying it out.

"The proposal is, briefly, that a selection be made each year of a number of students, about thirty in the first instance, in the first year of their course in science or engineering and that during their summer vacations for three or four years they should be sent to Camp Borden and there undergo, for a period of three or four months, a thorough training in aeronautics in all its phases, both theoretical and practical. They would pass through the workshops, learning the actual construction of the machines and engines, and be given courses of lectures on all phases of the subject and, in addition, taught how to fly the different types of machines. They would receive in addition to food and quarters, a small rate of pay corresponding to the amount they would probably earn while engaged on survey parties or working in factories as is the custom of such students during the vacations. The experience gained would be invaluable to them in their engineering and scientific course. Even if places could not be found for all such cadets, in the Air Force or in commercial aviation, they would form a reserve from which a supply of pilots could be obtained if necessity arose. The universities would continue the theoretical work during the sessions by giving lectures on aerodynamics and other kindred subjects. There would thus be ensured to aviation a constant stream of the best type of young men, throughly trained, not only in flying, but having the splendid background of a thoroughly scientific education as well."(4)

The adoption of such a scheme would mean that in a few years a new generation could be trained to take the place of those who, because of age or other reasons, had to give up flying. It was hoped to introduce this cadet training in the 1922-23 fiscal year, but the reduction in the estimates made it necessary to defer the plan for a year.

Not only was the new training scheme deferred, but the old refresher training courses were terminated on 1 April 1922 and flying at Camp Borden almost ceased. During the last nine months of the year only 131.45 hours were logged, as compared with 854 during the first quarter. The only training given during the latter part of the year was in ground courses for a small number of officers and airmen. The virtual cessation of training at Camp Borden permitted a reduction in the semi-permanent staff there, some of the surplus officers being employed on flying operations at other air stations throughout the country.

The reduction in the estimates and the reorganization of the services which was being carried out during the year "prevented any extensive programme of distinctively military flying being undertaken." At Sarcee military camp an aircraft from High River once again co-operated in the training, making four flights on artillery observation for batteries engaged in firing practice. Likewise, at Dartmouth three flights were

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(4) Air Board Report for 1922; pp. 25-6. It is believed that W/C Stedman was largely instrumental in framing this training scheme.

made on similar co-operation training with the garrison during which tests were made with radio-telephony. Aircraft from Camp Borden made about 40 flights on combined manoeuvres with the Army, and special courses of instruction in artillery co-operation were given at the station. Some photographic operations were also carried out from Camp Borden, including the mission to London, Ont., by F/L Grandy and Sgt. LeSueur which was mentioned previously. The total flying done by the CAF during 1922 on training, combined exercises, photography and other tasks was only 993 hours, a reduction of 2000 hours from the previous year.

Although flying training had been suspended, the CAF was expanding other fields of training. To instruct officers in administrative duties so that they could serve as adjutants at CAF stations, a special course was arranged at the Royal Military College in Kingston. Arrangements were also made to have CAF officers attend the one-year course given at the RAF Staff College at Andover, England. Officers selected for this higher training were given a three-month preparatory staff course at RMC before going overseas. The first officer selected to attend Staff College was W/C J.S. Scott who was a student in the second course given in 1923, and was the first CAF officer to qualify for the designation "p.s.a."

Through the first six months of 1922 W/C Scott was officer commanding the CAF. On 1 July when the new organization of the Air Services became effective he left Ottawa to take command of the Training Depot Station at Camp Borden, and W/C J.L. Gordon succeeded him in the new post of Acting Director, CAF.

At Camp Borden the Training Depot Station was under the command of S/L J.A. Glen at the beginning of the year. He relinquished the post on 16 May to return to duty with the RAF, and S/L A.E. Godfrey assumed temporary command until W/C Scott arrived seven weeks later. After three months in command W/C Scott was posted to Air Headquarters, on 1 October 1922, and attached to the Royal Military College for a special course preparatory to attending RAF Staff College. He was succeeded as C.O. of the TDS by S/L A.A.L. Cuffe (1 October - 1 November) and then by W/C W.G.Barker VC, DSO, MC. The latter officer, one of Canada's greatest air fighters, had been commissioned in the CAF in June 1922 and had been on duty briefly at Air Headquarters, Petawawa, Camp Borden and Kingston before being posted to command of the Training Depot Station.

Officer Personnel of the C.A.F. (1920-1922)

The first issue of CAF Weekly Orders, which appeared on 13 September 1920, carried the first list of provisional appointments to commissions in the new service. The 21 officers named were all, "with their consent", placed on duty for periods of two to nine months and posted to headquarters in Ottawa or the advance party at Camp Borden.(1) Subsequent issues of Weekly Orders through the next 18 months, to the end of March 1922, listed further provisional appointments, the great majority of the officers being posted to Camp Borden "for the normal training period" at the end of which they were granted leave without pay. Service numbers were not allotted, and in fact did not come into use for officers until the early months of the Second World War.

In addition to the announcements carried in Weekly Orders lists of Appointments, Promotions and Retirements, Canadian Air Force, were also published in "The Canada Gazette". The first list, dated 21 March 1921, appeared in the "Gazette" for 9 April 1921 and was very brief, containing only three names - A/C R.H. Mulock, G/C A.K. Tylee and W/C J.S. Scott. A second, much longer A.P. and R., dated 10 June 1921, was published on 6 August 1921, listing 1178 officers who had been appointed to commissions (in many cases provisional), ranking from pilot officer to wing commander. In all, ten A.P. and R. lists for the CAF were published in the "Gazette" during 1921 and 1922. They reported a total of 1315 appointments, including eleven in the Medical Service and three to RAF officers attached to the CAF. The great majority of the commissions were dated 18 February 1920, the official formation of the CAF. By ranks the appointments published in the first ten A.P. and R.s were:

Air Commodore	1	
Group Captain	1	
Wing Commander	4	(including 1 R.A.F.)
Squadron Leader	24	
Flight Lieutenant	172	(including 2 R.A.F.)
Flying Officer	426	
Pilot Officer	676	
Medical Service		
Hon.Group Captain	1	
Squadron Leader	1	
Flight Lieutenant	9	
Total	1315	

Two gradation lists were also published for the CAF in booklet form. "The Canadian Air Force List, June 1921" was a consolidation of the first two A.P. and R. lists, and contained 1185 names, including the three RAF officers attached to the CAF. The second booklet published in January 1922 combined the first seven A.P. and R. lists, with a total of 1238 names, including ten medical officers and the three RAF attached.(2) This CAF List omitted 11 names which had appeared in the June

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(1) The provisional appointments were retroactive in all cases, dating back to as early as 17 May 1920. Seniority of the officers was to be determined later.

(2) The CAF Lists also contained the names of four "attached" personnel - a Chaplain, an Equipment Officer (holding Army Rank), and two civilians in the Accounts and Medical Branches.

1921 List and added 64 new names, making a grand total of 1249 officers contained in the two Lists. The ranks reported in the two Lists were:

June 1921 List					January 1922 List			
Rank	Full Commission	Provisional	Total		Full Commission	Provisional	Total	
Air Commodore	1		1		1		1	
Group Captain	1		1		1		1	
Wing Commander	3 (inc 1RAF)		3		7 (inc 1RAF)		7	
Squadron Leader	11	10	21		12 (inc 1RAF)	11	23	
Flight Lieutenant	77 (inc 2RAF)	75	152		90 (inc 1RAF)	72	162	
Flying Officer	129	259	388		153	250	403	
Pilot Officer	148	471	619		192	439	631	
Medical Service Hon. Group Capt.					1		1	
Squadron Leader					1		1	
Flight Lieutenant					4	4	8	
Total	370 (inc 3RAF)	815	1185		462 (inc 3RAF)	776	1238	

From these three sources - Weekly Orders, Appointments, Promotions, and Retirements, and the CAF Lists - it appears that 1335 officers were appointed to outright or provisional commissions in the Canadian Air Force between 18 February 1920, the date of the "original" commissions, and 31 March 1922, the termination of the refresher training scheme. This total includes 32 officers who received provisional appointments in CAF Weekly Orders, but whose names of one reason or another - death, cancellation of appointment, etc. - were not published later in the CAF Lists or A.P. and R.s. It also includes 54 officers whose appointments

appeared in A.P. and R.s after the CAF List of January 1922 was published.(3) The combined rank structure from these sources was:

Rank	CAF Weekly Orders	CAF Lists (A.P.&R.s 1-7)	A.P.&R.s 8-10	Total
Air Vice-Marshal	1			1
Air Commodore		1		1
Group Captain		1		1
Wing Commander		7		7
Squadron Leader		23		23
Flight Lieutenant	9	165	9	183
Flying Officer	9	405	17	431
Pilot Officer	13	637	27	677
Total	32	1239	53	1324
Medical Service				
Hon. Group Capt.		1		1
Squadron Leader		1		1
Flight Lieutenant		8	1	9
Grand Total	32	1249	54	1335

(3) A.P. and R. 10 listed 25 new appointments, of which 12 were dated subsequent to 31 March 1922. These officers, who have not been included in the total of 1335, were W/C W.G.Barker, S/L C.J. Clayton, F/Ls E.S. Meek and A.T.N. Cowley, F/Os R. Milani and G.A. Crane, and P/Os A. Ferrier, D.R. Wood, A. Galt, E.E. Bennett, C.M. Clucas and C.J. Duncan.

D. Transition from Air Board to Department of National Defence

The new Liberal government led by Mackenzie King adopted a policy of centralization of the Dominion's defence services. The creation of a single department to embrace the Navy, Army and Air Board would not only mean greater economy, through combining functions common to all three, such as contracts, purchasing, accounting, engineering services, records and correspondence, and civil administration, but would also mean greater efficiency. The heads of the three services working together on a Defence Council under one Minister of the Crown would enable the Minister and, through him, the Cabinet to consider the defence of Canada as a whole and not as three separate questions.

> "It would ensure the preparation of a comprehensive scheme of defence, covering all phases of the question, by a general Defence Staff representing all three services, rather than three separate programmes, each dealing with one phase of the question only. It would further facilitate the organization and training of the defence personnel to act in co-operation, each arm with the others, so that in time of emergency there would be complete co-operation between the services. Each would then fill its predetermined role with knowledge and understanding of the work of the others. The combination would prevent overlapping and save the waste of effort inevitable under the old system of complete separation of the services."(1)

A bill to create one Department of National Defence was introduced in the House of Commons by Mr. Graham early in the 1922 session(2) and received Royal assent on 28 June. The act incorporated the former Department of Militia and Defence, Department of the Naval Service and Air Board in one Department of National Defence which was charged "with all matters relating to defence, including the Militia, the Military, Naval and Air Services of Canada." The section of the Air Board Act of 1919 which provided for the appointment of an Air Board was repealed, and the powers, duties and functions formerly vested in that Board were transferred to the new Minister of National Defence. To allow time for the reorganization of the three departments which would be necessary before their amalgamation could be completed, it was provided that the act would come into force on a date to be set by proclamation. The effective date was subsequently fixed as 1 January 1923.

Before the National Defence Act became law two members of the Air Board had retired, Col. O.M. Biggar and Air Vice-Marshal Sir Willoughby Gwatkin, on whom "had fallen the burden of the administration of the Department during its formation and to (whom was) largely due the rapid progress made in the successful

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(1) Air Board Report for 1922; p. 9.
(2) As originally introduced on 24 March, the bill proposed to include the RNWMP under the Minister of National Defence, but this provision was later deleted. Objections from the Opposition that the bill was in effect a money bill caused a change in the procedure of discussion.

development of flying in Canada, both civil and military."(3) Col. Biggar had served as vice-chairman of the Board from its first creation in June 1919 until September 1921 when he was appointed chief electoral officer; feeling that in his new office he should not continue to hold an executive post in the government, Biggar had submitted his resignation as vice-chairman, but it was held in abeyance until early in 1922. In the interim Sir Willoughby, who had been Inspector-General of the CAF since April 1920, acted as vice-chairman. On 31 March 1922 Sir Willoughby also submitted his resignation.

In reorganizing the air services, prior to the establishment of the new department, the first step was to consolidate the Flying Operations Branch with the CAF. Hitherto all civil government flying operations had been carried out by this branch of the Air Board, and all air stations except Camp Borden had been under its control. The personnel of the branch were appointed by the Civil Service Commission and employed as civil servants; yet virtually all members of its staff were also commissioned or enlisted in the CAF and had been granted leave from their civil duties when necessary to do training or other service with the CAF. This strange duality could be somewhat confusing. Pilots serving with the Operations Branch as civil servants were normally referred to by their Army style service rank (e.g. Captain); many of them were also employed at one period or another on the administrative and instructional staff of the CAF and then assumed Air Force ranks (e.g. Flight Lieutenant). Furthermore, at Camp Borden, which was the CAF's only station, both branches of the Air Board maintained establishments, the shops and stores being under civil management while the training and general administration were under Air Force discipline. This division continued until July 1922 when the equipment branch at Camp Borden was taken over by the CAF and its civil service personnel were put in uniform. Only the camp maintenance staff remained civilian. The change to Air Force discipline "simplified the administration and enabled reductions to be made in the numbers employed."

On the consolidation of the Flying Operations Branch with the CAF, the civil position of Director of Flying Operations became redundant. This appointment had been held since December 1919 by W/C R. Leckie, a Canadian officer in the RAF who was seconded for duty with the Air Board. Leckie ceased his secondment on 1 June 1922 and returned to the United Kingdom to resume his career with the RAF - which 20 years later brought him back to Canada again. Two other Canadian officers in the RAF, who had been seconded for duty with the Air Board and attached to the CAF, also returned to the RAF at this time. S/L J.A. Glen had been an Assistant Director of Flying Operations under W/C Leckie, and also served a term with the CAF as commanding officer of the Training Depot Station at Camp Borden from 30 December 1921 to 16 May 1922. The third officer, F/L J.A. Barron, had been an Assistant Director in the Technical Services Branch under W/C Stedman. With the gift equipment received from Britain there had been a considerable quantity of lighter-than-air material - kite balloons, small airships, hydrogen generating apparatus, etc. - and Capt. Barron, an expert on lighter-than-air operations, had been appointed as technical

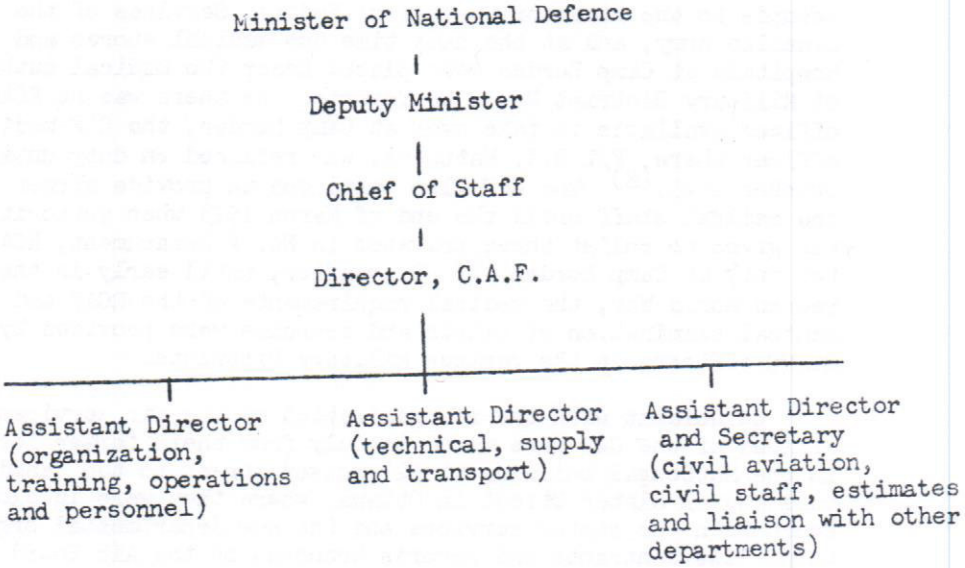
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(3) Air Board Report for 1922; p. 10.

adviser in its use. There was no opportunity, however, to establish a lighter-than-air service in Canada and, his services being no longer required, Barron returned to the RAF in June 1922.(4)

The next step in the transition from the old organization to the new was the authorization of a temporary establishment for the CAF to cover the period pending its re-organization on a permanent basis. The strength authorized for this interim period was 69 officers and 238 airmen.(5) It was also provided that officers and men employed in the Air Board as civil servants would be granted temporary commissions or enlisted in the CAF, and the whole organization was placed under a Director, CAF, who was responsible to the Chief of Staff of the Army for the control of aeronautics in all its phases, civil, military and technical.(6)

In place of the former Air Board organization with its five major branches for civil government operations, civil aviation, Canadian Air Force, technical services and secretariat, a new tripartite structure was established:



The new organization came into effect on 1 July 1922 when W/C J. Lindsay Gordon was appointed to the dual post of Acting Director, CAF, and Assistant Director for organization, training, operations and personnel. A member of the Flying Operations Branch of the Air Board since March 1920, Lindsay Gordon had

(4) The fabric of the kite balloons and "blimps" was used for many years for patching the roofs of the hangars at Camp Borden - which appears to have been the only use made of this equipment in Canada.

(5) By rank the temporary establishment provided for: 1 G/C, 3 W/C, 7 S/L, 16 F/L, 25 F/O, 17 P/O (total 69); 2 WO, 17 FS, 37 Sgt, 38 Cpl, 21 LAC, 76 AC1, 47 AC2 (total 238). Of the officers, 45 were for flying duties and 24 for ground; the airmen were divided into 121 mechanics, 79 other tradesmen, and 38 miscellaneous.

(6) P.C. 1345 of 29 June 1922.

recently completed a six-months tour of duty with the CAF as commanding officer at Camp Borden (July-December 1921). "His intimate knowledge of both the civil and Air Force duties made (his appointment as Acting Director) particularly fitting at a time when the amalgamation of the two Branches was in process."(7)

The position of Assistant Director for technical, supply and transport duties was assumed by W/C E.W. Stedman who had been Director of Technical Services under the Air Board since October 1920; and Mr. J.A. Wilson, Secretary of the Air Board, continued in office as Assistant Director and Secretary in the new organization, charged with control of civil aviation as well as administration of the civil staff, preparation of estimates and liaison with other departments. The position of Controller of Civil Aviation on Mr. Wilson's staff was assigned to S/L L.S. Breadner who had been acting in that capacity since July 1921 during W/C Scott's absence on duty with the CAF.

The new organization meant the disappearance of the medical branch which had been formed in the Air Board and the CAF. On 1 July 1922 Dr. W.H. Cronyn, the retiring director of the medical service in the Air Board, turned over his equipment and records to the Director General of Medical Services of the Canadian Army, and at the same time the medical stores and hospitals at Camp Borden were placed under the medical authorities of Military District No. 2 at Toronto. As there was no RCAMC officer available to take over at Camp Borden, the CAF medical officer there, F/L R.A. Matthews, was retained on duty until 1 October 1923.(8) The CAF also continued to provide airmen for the medical staff until the end of March 1923 when authority was given to enlist three privates in No. 2 Detachment, RCAMC, for duty at Camp Borden.(9) Thereafter, until early in the Second World War, the medical requirements of the RCAF and the medical examination of pilots and recruits were provided by RCAMC officers in the various Military Districts.

Coincident with the reorganization of the air services, the offices of the CAF were moved in July from their former location in the MacDougal building at 529 Sussex street to the Canadian building on Slater Street in Ottawa, where they were in closer touch with the sister services and the new departmental organization. The contracts and records branches of the Air Board were then incorporated in one common system serving the whole department, and the personnel of other branches dealing with phases of work common to the three services were also gradually amalgamated. The accountant branch retained its separate identity until the end of the fiscal year (31 March 1923) when a combined organization took over for the whole Department of National Defence.

Although the new organization of CAF headquarters became effective on 1 July 1922, the several air stations of the Operations Branch were not affected immediately. As the operation

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(7) Air Board Report for 1922; p. 11.
(8) Capt. and brevet Major Matthews, CAMC, was attached to the CAF for duty as medical officer on 4 January 1922, and was granted a provisional commission as flight lieutenant effective 28 December 1921.
(9) Report of the Department of National Defence for the fiscal year ending 31 March 1923; pp. 59-60.

season was then well under way and all stations were busy on flying activities for various departments, it was decided to defer their reorganization from civil to service administration until the end of the flying season in the fall. The changes necessary to bring them into the new scheme were then made gradually and as far as possible without disturbing their work.(10) During the operational season any new appointments required at the stations were made from CAF personnel and in the autumn, when the season's work was completed, the civil staff of the stations was incorporated in the CAF by commission or enlistment. Civil employees who did not wish to join the CAF were granted one or two months' leave with pay to find new employment. The final formal change was made on 25 November 1922 when the air stations at Vancouver, High River, Victoria Beach, Ottawa, Roberval and Dartmouth were officially redesignated CAF Units, and the air station superintendents became commanding officers.

In Manitoba winter accommodation for the personnel from Victoria Beach, Norway House and The Pas summer bases was obtained in the Fort Osborne Barracks at Tuxedo Park, Winnipeg, and a garage was rented for the overhaul and storage of the aircraft. Approval was obtained to purchase land adjacent to the barracks for use as an aerodrome. It was intended to make Winnipeg the CAF headquarters in the prairie provinces, from which units would be detached as required for operations from summer bases.

The abolition of the dual system of civil flying by the Operations Branch and service flying by the CAF was accompanied by the abolition of another duality that had persisted through the past two years. Daily routine orders issued by the Training Depot Station at Camp Borden on 28 November 1922 contained this paragraph:

> "The use of Military Equivalent of Canadian Air Force ranks will be discontinued throughout the Service forthwith and only the ranks hereunder quoted (i.e. group captain to pilot officer) will be used both in correspondence and conversation."

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(10) Air Board Report for 1922; p. 11.

Chapter VII

A. Parliament 1923

For the 1923-24 fiscal year the main estimates for the air service totalled $1,000,000, the same as the appropriation for the previous year. To this item, however, was appended another estimate of $250,000 for the purchase of new flying equipment. For the past three years the Air Board and the Canadian Air Force had been using the gift aircraft received from Great Britain and the United States. These aircraft were now wearing out and, being war types, were not practicable for the civil work on which they had been employed. Particular difficulty had been experienced with the large flying-boats which could not take off from the small lakes which dotted the areas over which much of the flying was done. As a start in re-equipping the Air Force with more efficient types it was proposed to expend about $175,000 on the purchase of eight Vickers "Viking" single-engined amphibians. To get early delivery of some of the aircraft for use in the 1923 season, two of the "Vikings" were to be shipped from England; the other six were to be made in the Vickers Canadian plant at Montreal.(1)

In presenting the estimates to the House, Mr. Graham reminded the members that the air service was "quite a costly one" as aircraft wore out quickly and spare parts were expensive. Nevertheless the service in one year more than repaid what it would cost in ten through the preservation of the forests and other preventive measures, and the demands made upon it by other departments and the provinces were doubled every year. "In expense, speed and practicability the air service has overcome time and distances." With reference to training in the Air Force, the minister told the house that it was proposed to begin training thirty university students that year in a new scheme "to evolve a force of very intelligent flying men."

Members showed little inclination to criticise the estimates this year and were much more interested in the possibility of expanding air operations to serve their constituencies. Recommendations were put forward that aircraft be used to investigate the possibility of a shipping route through Hudson Bay, to which Mr. Graham replied that an officer would be sent to visit Nelson and Churchill during the summer, but that there was insufficient money to undertake a year-long investigation such as the members advocated.

The value of the forest protection patrols was stressed by other members who urged their extension into northern Saskatchewan and Alberta. The minister answered the department would be delighted to do so if it had the money, but the service had now reached "the limit of its capacity" while the provinces were asking for more work than there were machines and men to carry out. ".... It is a question whether we shall not have to

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(1) A call for tenders, issued in the fall of 1922, specified an amphibian aircraft carrying a pilot and four passengers (or equivalent load), with a cruising speed of 80 m.p.h., a range of 6 hours, and a ceiling of not less than 12,000 feet; preference would be given to aircraft constructed in Canada. Only two of the tenders submitted met the latter stipulation.

enlarge the scope of the air force both as to men and machines.... We are hoping that another year we shall be in a position to ask with confidence for a good deal more money so that we can extend the service." (2)

There was a dissenting voice, however, from a Prince Edward Island member who questioned if the air service warranted the expenditure on it. He had been told that aircraft could not be used for mail service to his province during the winter when the island was isolated. If aircraft were only for war purposes was the estimate justified? The minister replied that the cost was out of all proportion to the necessity for air mail service to the island. This answer did not satisfy the member and later, during the debate on the budget, he again expressed his "suspicion" of Air Force expenditures. "Is it really necessary for this country to spend $1,660,822 in experimenting with flying machines which have not yet proven of commercial value to the country?" In case of war the work being done in the United States and Britain would provide all the information that Canada might need. "We all hope that the day is far distant when flying machines for war purposes will be needed, and I submit that in the meantime such a heavy expenditure as this is not justifiable."(3)

Shortly after the air estimates were passed Mr. Graham relinquished the portfolio of National Defence to become Minister of Railways and Canals. Hon. E.M. Macdonald, the member for Pictou, then became acting Minister of National Defence, from 28 April 1923, was confirmed in office on 17 August 1923, and headed the department until the fall of the King ministry three years later.

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(2) Hansard, 1923 Session; Vol. II, pp. 1748-51 (11 April), and 1774-78, (12 April). The main item was agreed to after relatively brief discussion on 11 April; the second item was allowed to stand over until the following day when it too was passed after some further debate.
(3) Hansard, 1923 Session; Vol. III, p. 2970.

B. Royal Canadian Air Force 1923

Service Operations

For three years, from June 1919 to June 1922, the Air Board had functioned as a separate branch of the government that was essentially civilian in character except for one of its components, the Canadian Air Force, which had a large body of reserve officers and airmen but only a small semi-permanent service staff. After June 1922 the civilian components of the Air Board were gradually consolidated in the Canadian Air Force which, on 1 January 1923, became a part of the new Department of National Defence and was placed under the control of the Chief of the General Staff. Through the next four and a half years service flying, civil government air operations, technical services, and the control of civil aviation were all Air Force functions administered by Assistant Directors. Organized and operated now on service lines this new Air Force began to re-equip with new aircraft and train new pilots.

Symbolic of the change in status of the CAF from its original position as one component in the Air Board to its new status as the sole government air service was a change in its title. Some time earlier the suggestion had been made that it should seek the distinction "Royal"; and in the spring of 1922 the idea was revived when Lt. Col. Stedman drew attention to the fact that the Australian Air Force had been granted that distinction.(1) Air Vice-Marshal Gwatkin, in one of his last acts before "silence descended" on him upon his retirement as Inspector-General, wrote to Major-General J.H. MacBrien, Chief of the General Staff, to ask him to try to obtain for the Canadian Air Force the right to use the prefix "Royal", "not at once, but as soon as things have settled down". The CAF had led the way in securing the right to fly the light blue ensign, and now that it was being "firmly established" it would like to share the privilege enjoyed by the Canadian Navy and permanent units and corps of the Militia.(2) The CGS replied that he was waiting until matters were more definitely settled when he would put forward the recommendation. The matter was then BFd until the proclamation was issued bringing into effect the National Defence Act.

On 5 January 1923, when the reorganization was completed and the new department had officially come into being, formal application was made to the Secretary of State for External Affairs. The Canadian Air Force had now been reorganized as a permanent branch of the Canadian defence forces and hoped that the Governor-General would petition His Majesty to confer the title "Royal" upon it. "Such a distinction would be most highly prized by all ranks and would add greatly to the prevailing esprit-de-corps." Thousands of Canadians had served as pilots, observers and airmen during the war, and "by their efficiency, gallantry and devotion to duty added lustre to the name of Canada". The reconstituted CAF had been organized almost entirely from the survivors of that body of officers and men.(3)

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(1) On 13 August 1921.
(2) Gwatkin to MacBrien, 10 May 1922; A.F.H.Q. file 045-3.
(3) G.J. Desbarats, Acting Deputy Minister, to Under Secretary of State for External Affairs, 5 January 1923; ibid.

The Governor-General, Lord Byng, duly forwarded the petition in despatch No. 27 of 15 January and on 15 February 1923 the Secretary of State for the Colonies replied that it had been laid before His Majesty the King "who has been graciously pleased to approve of the Canadian Air Force being designated 'The Royal Canadian Air Force'."(4) The Department of External Affairs referred the despatch to the Department of National Defence, on 2 March 1923, and Weekly Order No. 21/23 was issued on 12 March to promulgate the new title.(5) The designation "Royal Canadian Air Force" was first used in orders on 13 March and in correspondence the following day.(6)

When the CAF became "Royal" it decided to adopt the dress and motto of the Royal Air Force. The uniform was to be of the same pattern as that of the RAF except for the substitution of the letters RCAF for RAF upon badges and buttons.(7) Pending drafting of detailed clothing regulations, the dark blue uniform of the CAF continued in wear until 1926.(8) The CAF motto "Sic Itur ad Astra" was discontinued in favour of "Per Ardua ad Astra."(9) Similarly Royal Air Force drill and ceremonial, as laid down in Air Publication 818, were adopted for the RCAF.(10)

Another significant development of the year was the introduction of a pilot training scheme which, during the next decade, brought a new generation of airmen into the service. The scheme had originally been proposed in 1922, but had to be deferred for a year because of the reduction in the estimates. In the spring

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(4) Despatch Canada No. 82, 15 February 1923 (signed by the Duke of Devonshire); ibid.
(5) A memo by W/C J.L. Gordon, Acting Director, CAF, which served as the basis for the weekly order stated that the new designation would apply only to the permanent force, the temporary force would still be known as the CAF. A note appended to the weekly order explained that "although the organization of the permanent Canadian Air Force is not yet complete, the prefix will apply to that part of the Canadian Air Force which will eventually become the Permanent Canadian Air Force." This decision was subsequently cancelled (by 28 November 1923) and RCAF was used for both permanent and non-permanent components.
(6) Years later, in 1935, when A/C Croil was Senior Air Officer, he found it difficult to give a suitable French equivalent for Royal Canadian Air Force in translating an article for a French magazine. As Royal Air Force was not translated into French he suggested that the RCAF do likewise and use the term "Royal Canadian Air Force" in all translations with "no attempt to find a comparable title in the French language". The file (045-3) does not indicate that the suggestion was put forward officially. In June 1940 when the Royal Canadian Air Force Act was passed (S.C. 1940, chap. 15, 4 George VI) the French version used the term "Corps d'aviation royal canadien". The French title, and the abbreviation CARC, were subsequently used in correspondence, advertising material, etc.
(7) Weekly Order No. 26/23, dated 19 March 1923.
(8) Weekly Order 10/26 of 30 January 1926 permitted officers to continue use of the C.A.F. uniform as a working dress until 1 April 1926.
(9) Weekly Order No. 38/23, dated 23 April 1923.
(10) Weekly Order No. 48/23, dated 25 June 1923.

of 1923 the plan was put into operation. A candidate for pilot training was required to be a member of a Canadian Officers Training Corps unit at a university;[11] a student in a course leading to a degree in applied science; physically fit for service as a pilot; under 21 years of age; unmarried; and recommended by the military committee of his university. He was also required to give an undertaking that he would complete the whole course. The course consisted of three terms in consecutive years given during the academic vacation from about the middle of May to the end of August. While in attendance at the Camp Borden training station the cadets were granted temporary commissions as provisional pilot officers (PPOs) and paid $3 a day during the first term, $3.50 during the second, and $4. during the final term.[12] Quarters, rations, uniform, travelling allowance, medical and dental treatment were provided free. On completion of the course the trainees received commissions in the RCAF and were eligible for (a) appointment to permanent duty as pilot officers (they were warned that the number of such vacancies would be very limited), (b) appointment to the non-permanent force (involving active duty for 28 days in every two years, and in emergency), or (c) transfer to the reserve of officers (liable for further service only in an emergency).[13]

Although it had been hoped to start with a course of 30 pupils, "unavoidable delay" in announcing the scheme until very late in the academic year kept the initial intake far below that figure. The first course, which reported to Camp Borden on 15 May 1923, numbered only nine cadets.[14] One of the group had to drop out for medical reasons a month later; the remaining eight completed the first term on 31 August. Six returned for the second term in 1924, and four - C.M. Anderson, E.J. Durnin, C.R. Slemon and W.C. Weaver - qualified for their pilot's flying badge in December of that year.[15] The four graduates were subsequently appointed to commissions in the permanent force. P/O Anderson was killed in a flying accident on a "Siskin" at High River on 28 June 1927. A fortnight later, on 11 July 1927, P/O Weaver lost his life when a "Viking" crashed in Manitoba. P/O Durnin resigned his commission in September of that year. The one remaining member of the first group of post-war trainees, P/O Slemon, remained in the service and ultimately rose to the rank of air marshal and the post of Chief of the Air Staff, just 30 years after he began training with the Air Force at Camp Borden.

In addition to new pilots the Air Force also needed new mechanics. During the transition period from the Air Board to

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(11) The cadet was required to have passed the practical examination for the COTC "A" certificate at the time of beginning training, and to be in possession of that certificate before starting the second term of air training.

(12) The term PPO did not come into use until 1924; the original intake in 1923 were ranked as "Cadets". As they were taken on strength at Camp Borden for all purposes except pay it is presumed that the original group were in receipt of Army pay during the first term.

(13) Report of the Department of National Defence for the fiscal year ending 31 March 1923; pp. 38-9.

(14) C.M. Anderson, E.J. Durnin, H.M. Durnin, B.C.C. Glynn, R.E. Knowles, J.C. McLennan, C.R. Slemon, W.O. Stevens and W.C. Weaver.

(15) The four PPOs remained at Camp Borden after the second term ended to continue with their third term.

the RCAF many mechanics had been released because they were over age, medically unfit, or unwilling to exchange their civil servant status for permanent enlistment in the Air Force. It was difficult to fill their places with suitable recruits; and high wages and ample employment opportunities in the civil field indicated that this would be a continuing problem. As a solution it was suggested that a boy's training establishment be set up where selected youths of good education and antecedents could receive a thorough grounding in air force trades and duties. After completing their training and serving with an active unit for their term of enlistment, the men could return to civil life with full assurance that their training and experience would ensure them ready employment at good wages. Such a scheme would not only help to satisfy the Air Force's need for skilled tradesmen, but would also benefit civil aviation and industry in general by providing a steady stream of highly trained and efficient mechanics. Although the plan was put forward in 1923 several years elapsed before it was briefly put into effect.

During 1923 the major role of the RCAF was the conduct of flying operations for other departments of the government. Between 1 April 1923 and 31 March 1924 the service logged 2090.25 hours of flying.(16) More than two thirds of this total was on civil operations - forest patrol, photography and survey, transportation, preventive patrols, and the like -(17), the forest protection work alone accounting for 36% of all the RCAF's flying. Only 681.30 hours were classified as "service flights". In addition to flying training, the "service" activities included six combined training exercises and courses with the Navy and the Army, which involved 90.20 hours of flying. During July a ten-day staff course was held at St. Johns, P.Q., followed by another brief staff course and an artillery observation course, both at Sarcee Camp, Alberta, in August. At Dartmouth two courses were conducted in October and November for battle practice and coast artillery co-operation. The year closed with another artillery observation course at Camp Borden which lasted from 19 November to 5 December.

In all these exercises, wireless communication between ground and air was demonstrated with the assistance and supervision of the Royal Canadian Corps of Signals. The Corps also operated a station at Ottawa for radio communication between headquarters and Camp Borden, and four other stations at High River, Winnipeg, Victoria Beach and Norway House for the forestry and other civil government operations. An additional station was being constructed at Jericho Beach, Vancouver. The High River station was able to maintain one-way communication, air to ground, over an average range of 150 miles for speech. The Manitoba system, which was open from May until the end of October, served not only for communication between the three bases, but also could pass messages to High River over a distance of approximately 790 miles.

The great air training centre at Camp Borden, which the Canadian Air Force had "inherited" from the Royal Air Force, was

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(16) The annual Reports on Civil Aviation, which describe in detail the civil government air operations of the R.C.A.F., cover calendar years, while the Reports of the Department of National Defence which give the service picture deal with fiscal years. As a result there are discrepancies in the statistics cited.

(17) For an account of these operations see Section C.

beginning to prove something of a white elephant. The temporary war-time buildings were becoming increasingly costly to maintain and repair, and the whole establishment (including 17 hangars) was much larger than the small requirement of the peace-time RCAF. Furthermore, the "isolated location" of the station was regarded as a handicap. A move to a more central location at Long Branch was being considered.(18) The unsatisfactory condition of Camp Borden was emphasized by two serious fires in 1923. In the first blaze on 29 August the aircraft repair section, a hangar, the dope shop, paint shop, and latrine were all destroyed; the second fire, on 16 October, wiped out the technical stores building and its contents. The total loss in the two fires amounted to $230,000 in equipment and stores (including twelve aircraft), and $30,000 in buildings. A court of inquiry was unable to determine the cause of the first fire, but in the second case arson was suspected, some peculiar circumstances suggesting that a firebug may have been in the vicinity.(19)

W/C Barker was in command at Camp Borden throughout the year. The designation "Training Depot Station" remained in use until the latter part of August when it was changed to "Royal Canadian Air Force Station, Camp Borden."(20) The establishment of the station (at 1 October 1923) was 19 officers and 137 airmen, the actual strength being 14 officers and 120 airmen. F/L G.V. Walsh was adjutant, F/L O. Berry accounting officer and F/L G.J. Blackmore quartermaster. The training section headquarters was under S/L N.R. Anderson, with F/L G.E. Brookes in charge of flying training, F/L A.C. Snow armament, and F/O F.V. Heakes photography. The technical section was headed by S/L D.C.M. Hume, under whom there were technical stores in charge of P/O A.H. Wylie, aircraft inspection department in charge of F/L R.J. Grant, engine repair section in charge of P/O T.A. Lawrence, and aeroplane repair section in charge of F/L R.G. Fraser. The last-named officer died at Christie Street Hospital in Toronto on 18 November 1923; he had been in charge of the aeroplane repair section since January 1922.

Those who served with W/C Barker at Camp Borden remember him as an officer of brilliant ideas, particularly in the field of air armament. Despite one arm crippled from wounds suffered in combat in October 1918, he was a crack shot and invariably headed the list in the weekly target practices on the range. For aerial gunnery practice he suggested equipping the Avro trainers with a shotgun fitted with Constantinesco synchronisation gear, and with his armament officer he worked out the designs for its installation. The plans were all destroyed in the second fire at Camp Borden in October of that year, and the idea was never revived. Another of his proposals (which was later to become standard practice on fighter aircraft) was to mount machine-guns on the wings of aircraft where they would be outside the propeller arc, thus doing away with interrupter gear and increasing the volume of fire. The use of balloons for aerial gunnery practice was in his opinion unrealistic; he suggested using cormorants or other such birds which could take "evasive action" and provide a more realistic target. To demonstrate his idea he once caught a

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(18) See Report of Department of National Defence, 1923-1924; p. 75.
(19) Hansard, 1924 Session; Vol. II, p. 1347; and Vol. V, p. 4816.
(20) Weekly Order No. 72/23, dated 25 August 1923.

sea-gull while fishing, and took it into the air with his adjutant serving as gunner armed with a shotgun. At 4000 feet the bird was released and Barker "found" it with the Avro until his gunner (who had little stomach for such practice) succeeded in winging the sea-gull.(21)

During the war W/C Barker, while serving in Italy, had been directly associated with the use of parachutes for dropping intelligence agents behind the enemy lines. In later years while serving with the RCAF, he was instrumental in introducing the use of parachutes into the Canadian service and may also have played a part in their adoption by the RAF. Early in 1925, a few months after the RCAF had started parachute training, Barker paid a visit to Bagdad, to study RAF operations in Iraq. He was "astonished to discover that the RAF were conducting a small war over the Kurdish mountains without parachutes" and suggested that they should be provided.(22)

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(21) From conversations with A/V/M Walsh and other officers.
(22) Letter from A/V/M R. Collishaw, 22 January 1957.

C. Civil Government Air Operations (1923)

In the past, ad hoc interdepartmental committees had met at the beginning of each year to co-ordinate the flying programme for the government departments. This practice was now placed on a more formal basis with creation of a permanent committee which met for the first time on 14 March 1923. In addition to officers of the Department of National Defence, the committee comprised representatives from ten branches of the Department of the Interior as well as officials from the Departments of Mines, Agriculture, Public Works, and Indian Affairs. From proposals previously submitted to it the Air Force had prepared a tentative programme of operations which the committee discussed and pared to the limits of funds and aircraft available. The programme finally approved envisaged 1840 hours of flying, divided between Winnipeg (865 hours), High River (835), Vancouver (75) and Ottawa (65 hours). This was about one-third less than the previous year's total of civil government work, accounted for by the cessation of operations at Whitney and Roberval.(1) The volume of work at other stations was also decreased to some extent, except in Manitoba where a great expansion was planned.

As in previous years forest patrols constituted the greater part of the programme, with provision for 1440 hours (or over 75% of the total flying), divided between Manitoba (700 hours), Alberta (700 hours) and British Columbia (40 hours). The other tasks scheduled were preventive patrols from Vancouver (25 hours), experiments in crop and forest dusting for the Department of Agriculture (30 hours), transportation for treaty money parties in Manitoba (35 hours), transportation in Alberta for the Geodetic Survey and in Manitoba for the Department of Mines (70 hours), and a variety of photographic and reconnaissance operations (240 hours). The chief customer for photographic work was the Topographical Surveys Branch which was allotted 80 hours in Alberta and Manitoba; the remainder of the time was divided between the Water Power Branch, Reclamation Service, Forestry Branch, and Parks Branch of the Department of the Interior.

Although the volume of aerial photography was still relatively small, so many requests were being received from so many sources that it was decided to establish more effective

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(1) In pursuance of the policy to encourage commercial aviation in every way, the Department of National Defence notified the provincial governments that it was prepared to relinquish to commercial companies or provincial air services the forestry operations which the Air Board had carried on during the past three years on a repayment basis. Both Ontario and Quebec thereupon took over this work. Ontario set up its own provincial air service, while Quebec gave a contract to the Dominion Aerial Exploration Company which operated from Roberval using two HS2Ls, a spare engine and some stores on loan from the Department of National Defence. In British Columbia, however, there was no commercial firm able to take over the provincial work, so the Department of National Defence continued its services on repayment, as in the past. In the three prairie provinces the natural resources were still in the hands of the federal government, and forest protection work there continued until 1930 (and on a smaller scale for several years thereafter).

control of the work by designating the Topographical Surveys Branch, the primary user, to act in an advisory and consulting capacity so as to avoid overlapping and duplication. The Air Force would be responsible for exposure, development and printing of the photographs, while the Surveys Branch was responsible for the technical work of examining the photographs and devising means of using them for mapping purposes. To obtain the best possible scientific results - and not merely "pretty pictures" - the Surveys Branch co-operated closely with the Air Force in drafting the operation orders for all photographic work; it also advised on such technical matters as the type of camera to be used, focal length, special films, plates, and light filters, and the altitude, direction and inclination of the picture.(2)

Civil government air operations in 1923 were carried out entirely by service personnel not, as in previous years, by civilian employees of the Air Board. Another highlight of the year's work was the appearance of the first new aircraft to replace the obsolescent war-time types that had been used since 1920. The total amount of work completed during the year, however, fell about 20% below the programme that had been scheduled. This was due in part to financial limitations, a perennial problem, in part to the weather, and also to some extent to "the unsettled conditions due to the reorganization of the service."(3)

In the western provinces there was little fire hazard during the summer, thanks to continuous wet weather, and as a result there was considerably less forest patrol than in previous years, the total being only about 750 hours, or slightly more than half the scheduled amount. This was compensated to some extent by an increase in aerial photography, particularly in the maritime provinces, but even this part of the programme encountered handicaps. In British Columbia the wet weather which made fire patrols unnecessary also interferred with the photographic work, and in Manitoba the late delivery of the new "Viking" amphibians delayed operations until after the optimum season of the year. Experience showed that, if the best results were to be obtained, photographs should be taken not later than 15 July, when the sun was at its highest and atmospheric conditions were best. Furthermore, with the older equipment that was still in use it was difficult to reach and maintain the altitude (10,000 feet) that was required for photographic work. This difficulty was attributed to two factors. The war-time engines had seen much service since their acquisition in 1920 and were due for replacement by more efficient types. There was also a personnel problem. "On the reorganization of the service a number of the older and more experienced mechanics preferred to take their chances in civil occupations rather than join the permanent Canadian Air Force. The operations suffered accordingly through the failure of the relatively inexperienced mechanical staff to obtain full satisfaction out of the aircraft engines on the stations."(4) It was hoped that the purchase of new engines,

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(2) Dr. E. Deville, Director General of Surveys, prepared a report on Aerial Photographic Operations, 1923, which was published in the Report on Civil Aviation for 1923, pp. 42-45.
(3) Report on Civil Aviation, 1923; p. 27.
(4) Ibid.; p. 26.

modifications to improve existing types, and the enlistment and training of a thoroughly experienced staff of mechanics would ensure more satisfactory results in 1924.

For 1923 the results were 867 flights for a total of 1422.50 hours and approximately 90,465 miles, which compared with 1210 flights, 2784 hours and 192,323 miles for the previous year. Operations were carried out from Vancouver, High River, Victoria Beach (with sub-bases at Norway House and The Pas), Ottawa and Dartmouth. Between them the Alberta and Manitoba stations accounted for more than two-thirds of the flying.

Vancouver*

The air station at Jericho Beach, under the command of S/L A.E. Godfrey, had a staff of two pilots (F/L Cowley and F/O MacLeod), a photographer (P/O C.J. Duncan), a civilian storekeeper (Mr. F.B. Gillespie), and 23 mechanics. Three HS2Ls were in service, to which one of the new Vickers "Vikings" was added late in the year. The permanent hangars had now been completed, and a wireless station was being constructed; wireless equipment was installed in one of the HS2Ls during the summer. Flying during the year totalled 270 hours.

The major part of the station's work was on preventive patrols for the suppression of smuggling and illegal fishing. The customs patrols had originally been instituted to prevent the smuggling of narcotics; now, as a result of the enactment of the 18th Amendment in the United States, the patrols were also needed to stop illicit liquor traffic in the coastal waters. The thirty-nine hours which were flown on this work left "no doubt that the moral effect of using aircraft to cope with the rum-running trade is a great deterrent." The "Trucilla", a fast motorboat suspected of engaging in the liquor traffic, was seized as a result of the aircraft patrols.

A new development in this field was an experiment to prevent illegal fishing in the Prince Rupert area. At the request of the Fisheries Branch of the Department of Marine and Fisheries, S/L Godfrey flew from Vancouver to Prince Rupert on 22 July, covering the 478 miles in 7.45 hours flying time with stops at Alert Bay and Bella Bella en route. The results of his patrols were so satisfactory that the fishery authorities asked that the work be continued until the close of the fishing season in September. F/O MacLeod was accordingly detached to Prince Rupert to patrol the salmon gill-net areas of the Naas and Skeena rivers, and the mouths of streams from the Alaskan border to a point 200 miles south of Prince Rupert; flights were also made across Hecate Straits to the Queen Charlotte Islands. In all, 72 hours were flown on fishery patrols "and the experience demonstrated the fact that the air service can be of considerable assistance from a standpoint of increased efficiency at a

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*The official designation of all bases (except Camp Borden) was C.A.F. Unit - R.C.A.F. Unit from March 1923 - until the beginning of October 1923 when the designation became "R.C.A.F. Station."

The 18th (Prohibition) Amendment was ratified in 1919 and enforced in 1920.

reduced cost."(5)

The commonest violations of the fishing regulations were the use of long gill-nets and fishing in prohibited areas or during closed periods. It was a simple matter for the crew of an aircraft to detect operations in closed areas or seasons and report them to a patrol boat which would apprehend the offender. The illegal long nets could also be discovered from the air, and in such cases one of the aircraft crew was left on board the fishing boat until a patrol vessel could be notified to pick up the fisherman and his gear. The experience of this first season showed that the aerial patrol had great moral effect. In the past, illegal fishermen simply posted a lookout at some convenient spot to warn them of the approach of the patrol boat and thus were able to clear out of prohibited areas before it arrived. With air patrol this was no longer possible. "The fishermen...never know at what moment (the seaplane) may swoop down on them, and in fact to a lawbreaker every bird in the air is looked upon with suspicion."(6) In 1924 it was proposed to extend this "new field of useful work for aircraft" which greatly increased the range, speed and extent of vision of the protective patrols and made possible more efficient control of the movements of the fishing fleets.

Another innovation at Vancouver was in connection with the use of aircraft in the white pine blister rust control work of the Department of Agriculture. Some reconnaissance flights had been made for this work the previous year; they were continued and a new experiment was also tried. To collect data on the dispersal of the rust spores two experimental flights were made in September during which glass slides, covered with a light coating of vaseline, were exposed at various altitudes up to 5,000 feet. Spores were trapped at every exposure, showing that the disease might be carried by the wind over wide stretches of country. This was confirmed by the numerous reconnaissance flights that were made along the coast, northwards from Vancouver, to determine the extent of the rust infestation at different seasons. One series of flights, which covered 660 miles in 13 hours' flying, went as far north as Bella Bella and Ocean Falls. Mr. A.T. Davidson, the official in charge of the field work, was greatly surprised to find that, although Ocean Falls was not infected, there were signs of the disease at Namu, more than 100 miles beyond the most northerly stand of white pine. He was deeply impressed by the value, efficiency and economy of aircraft in reconnoitring the blight areas and in determining the spread of the spores. The station flew 49 hours on this work.

Forest fire patrols over the "Railway Belt" for the provincial government were very limited this year thanks to the low fire hazard; only three flights were required for a total of nine hours. On photographic assignments twelve hours were flown for the Water Power Branch, and fourteen hours on miscellaneous tasks for the Department of Public Works, the New Westminster Board of Trade, Canadian National Railways, the Canadian Government Exhibition Commission, and the Provincial Surveyor General.

Among the other flights carried out from Jericho Beach were two of special interest. On 25 July S/L Godfrey and F/L Cowley

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(5) Ibid.; p. 27.
(6) Ibid.; p. 28.

flew to Campbell River to deliver newspapers and a message to the U.S. President Warren G. Harding who was visiting Canada just a few weeks before his death. Flying via Texada Island and Duncan Bay, the airmen covered the 230 miles in 3.20 hours. The next day an HS2L flown by F/L Cowley escorted the president's ship as it entered Vancouver harbour.

In addition to flying operations Jericho Beach was also a centre for flying training. Ab initio pilots, or older pilots requiring some refresher training, went first to Camp Borden for instruction on landplanes. On completion of the course there, the pilots were as a rule posted to Vancouver for conversion to seaplanes before being assigned to an operational station. During 1923 several pilots who previously had been flying landplanes at High River were converted at Jericho Beach.

High River

The old war-time DH4 biplanes were still in use at High River. After four successive years' service in the foothills of the Rockies, the aircraft had virtually reached the end of their useful life. Careful overhaul at the end of each season had enabled them to carry on without one forced landing; nevertheless it was imperative that they should be replaced at an early date by new, smaller and lighter aircraft that would be more economical to operate and maintain.

The station had a staff of six officers and 22 airmen. S/L Croil, who had been in charge of operations in Alberta since the inauguration of forestry patrols in 1920, remained at High River until 7 October 1923 when he was posted to Air Headquarters and succeeded by S/L A.A.L. Cuffe. There was a sharp drop in flying during the year, the total on civil work being only 510 hours, or less than half that of the previous year.

This decrease was wholly accounted for by wet and snowy weather in the early months of the year which so reduced the fire hazard in the forest reserves that no patrols were necessary before August. The autumn, however, was dry and patrols were flown over the Crowsnest and Bow River reserves until the beginning of December. As in the previous year, landing-grounds were used at Eckville and Pincher Creek; occasional patrols were also made over the Rocky Mountain Park. In the course of 400 hours flying on forest patrol three fires were reported within the reserves and fourteen more close to their boundaries.

Considerable photographic work was also done from High River, using a specially equipped DH4. From a temporary base at Wetaskiwin an aerial survey was made of the Cooking Lake forest reserve, east of Edmonton; 800 negatives were exposed in 16 hours flying, from which a complete mosaic was prepared. About the same amount of flying was done for the Reclamation Service to locate suitable reservoir sites on the headwaters of streams flowing towards the prairies. Other photo operations were carried out for the Topographical Surveys Branch (11.40 hours) and the National Parks Branch (10.50 hours).

High River was now kept open throughout the year instead of being closedduring the winter months, and was used for some interesting experiments in cold weather flying. Through February and March 1923 S/L Croil, F/L A.A. Leitch, and F/Os

A. Carter and G.R. Howsam carried out a series of tests on a DH4 to study the efficiency of various starting procedures, oils, antifreezes, and service and tropical radiators in temperatures ranging from 14 degrees below zero to 40 above. Prof. C.A. Robb, professor of mechanical engineering at the University of Alberta, was also carrying out experiments with antifreeze oil, carburetors, radiators and other equipment in the operation of aero engines in low temperatures.(7) For the winter of 1923-24 further tests on a De Havilland were scheduled at High River, the object being "to carry out, if possible, a daily patrol on every day that it is not actually raining or snowing." W/C Stedman visited the station in January 1924 to observe the experiments and had some test flights made with a ski-equipped DH4. As a result of his suggestions a very satisfactory type was developed which made possible the first successful flights in Canada by a "heavy" aircraft fitted with skis.

After his visit to High River W/C Stedman recommended that a special unit be formed at that station to undertake winter flying research, but "lack of funds" prevented any action that year. Finally, in August 1925, S/L Cuffe, then in command at High River, suggested that, because of erratic weather conditions at that station, Winnipeg, Camp Borden or Ottawa would be more suitable for winter flying tests, and headquarters decided to suspend the work at High River. Thereafter most of the winter experimental flying was done at Ottawa.(8)

Manitoba

For operations in Manitoba the Air Force had a winter repair depot in Winnipeg, a main operational base at Victoria Beach, and two sub-bases at Norway House and The Pas. The total staff numbered seven officers and 30 airmen under the command of S/L Hobbs. After being overhauled and reconditioned during the winter months, the four HS2L flying-boats which had been used in previous years were shipped from Winnipeg to Victoria Beach, erected there and flown to the other bases. Victoria Beach was opened for operations on 25 May, followed by Norway House on 11 June and The Pas on 13 June. Flying had barely started when one of the flying-boats was wrecked in a cyclone at Victoria Beach on 22 June, leaving only three aircraft available for operations. A twin-engined Curtiss H16 was then erected at Camp Borden and flown out to Winnipeg in July to fill the gap. It had been hoped

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(7) When W/C Stedman visited the U.S. Air Service Engineering Division at Dayton, Ohio, in June 1923 he offered to supply data on RCAF. experience in winter flying, and the Americans sent a detailed questionnaire, subsequently expressing their thanks for "interesting and useful aeronautical data". Two years later when the RCAF, at the request of the British Air Attache in Washington, asked for information on winter manoeuvres carried out by a pursuit group in northern Michigan the Americans replied that very little low temperature effect had been noted, but they would like to have Canadian data for comparison. The RCAF responded with copies of reports by Stedman and Robb, whereupon the Americans reciprocated with some of their reports.

(8) In the winter of 1927-28 cold weather tests of a "Siskin" fighter were conducted at High River and Edmonton. On the early winter flying research see AFHQ file 1008-1-10.

that the new Vickers "Vikings" would be available at the beginning of the season to relieve the old flying-boats, but the first amphibian did not reach Victoria Beach until 12 July; two more arrived on 22 August and 16 September when the flying season was far advanced.(9)

Despite the limited number of aircraft during the early months, the Manitoba units were able to increase their flying time by 50% over the previous year, making 261 flights for a total of almost 488 hours. The greater part of this time, approximately 300 hours, was on forestry patrol.

Throughout the flying season, from early June until late October, the three bases maintained a regular schedule of daily forest patrols except on a few occasions when aircraft were not available because of other commitments. Victoria Beach flew 112 1/2 hours and reported 22 major fires; Norway House located 20 fires during 75 3/4 hours on patrol, and The Pas found 15 in 111 1/2 hours of flying. On several occasions the flying boats transported fire fighting crews, provisions and equipment to the scene of the forest fires. During the latter part of the season at Norway House a forest engineer accompanied the aircraft crew on their patrols to make sketch maps of forest types in an area of some 2500 square miles.

Victoria Beach and Norway House provided transportation flights for Geological Survey parties of the Department of Mines and treaty money parties of the Department of Indian Affairs. Aircraft from the first base flew about seven hours in July to carry 525 pounds of provisions to a survey party working in the Manigotogan-Hole River area, while Norway House laid down a cache of 400 pounds of supplies at Cross Lake for another party. From Norway House a treaty money party was flown to Cross Lake, Oxford Lake, God's Lake and Island Lake, the 500-mile route being covered in 8.40 hours flying time spread over six days. In addition to paying treaty money to the Indians, the party carried out medical examinations and other administrative work. Victoria Beach did 20 hours flying for treaty money parties. One of these flights, to Little Grand Rapids, Pekangekum and Deer Lake late in July, illustrated some of the problems of flying over virtually unknown terrain. Not only was such exceedingly bad weather encountered that the aircraft was delayed for several days en route, but "great difficulty was experienced in locating the various lakes. The whole country is absolutely unmapped and even the guide carried in the machine, who had travelled the country for years, could not identify the different routes or lakes when he was flown directly over them or when a landing was made."(10)

The photographic programme which had been proposed for Manitoba had to be postponed and curtailed because of the late arrival of the "Viking" aircraft. In September, however, when the best weather conditions had passed and the light was far

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(9) E T, the first "Viking" delivered to Victoria Beach, was one of the two aircraft that had been manufactured in England and erected at Montreal. E S, the other U.K.-built aircraft, was damaged in an accident at Ottawa on 5 July 1923. EU and EV were the first of the Canadian production; after preliminary tests at Ottawa they were delivered by air to the Manitoba base.
(10) Report on Civil Aviation, 1923; p. 33.

from favourable, several operations were started for the Topographical Surveys Branch. In the fortnight from 24 September to 7 October Victoria Beach flew 26 hours to photograph 180 miles of the Manitoba-Ontario boundary northwards from the Winnipeg river. A second operation was carried out from The Pas between 12 and 14 September for a total of 25 hours flying. With a Dominion land surveyor in the crew to act as camera operator and navigator, the aircraft made a series of flights over the waterways in the area between Reed Lake, Cranberry Lake, Athapapuskow Lake, Kissinew (Kisseynew) Lake, Pukattawagon, and Nelson Lake, eastward as far as Setting Lake.

Throughout the flying season the Royal Canadian Corps of Signals maintained wireless communication between Norway House and headquarters in Winnipeg.

The sub-base at Norway House was located on Forestry Island, the district forestry headquarters, in the eastern channel of the Nelson River; it was about 40 miles from Lake Winnipeg and 300 miles due north of the Manitoba capital. The other sub-base at The Pas was sited at the junction of the Saskatchewan and The Pas rivers, about 150 miles due west of Norway House and 275 miles northwest of Winnipeg. When the sub-base was opened on 13 June both rivers were in flood which caused great difficulty in mooring the aircraft in the heavy current and unsheltered position.

In Manitoba, as at other stations, the work during 1923 had been hampered to some extent by inexperienced mechanical staff who were unable to get "full satisfaction" from the equipment, particularly the new machines. Some of the older mechanics at Victoria Beach had elected to return to civil life rather than enlist in the CAF upon reorganization of the services, and those who remained, while very willing, lacked experience in the work. The year's operations also stressed the need for improved ground facilities, in particular ample stocks of spare engines and parts, to support activities in a remote country such as northern Manitoba where the bases were widely separated and supplies were difficult to obtain and transport.

Ottawa

The small station at Rockcliffe, numbering three officers and fifteen airmen under the command of F/L C. McEwen, was engaged chiefly in testing and experimental work. New aircraft were tested on delivery from the contractors and then ferried to outlying stations, and much experimental work was done in co-operation with the Topographical Surveys Branch to develop methods of aerial photography for the making of maps.(11) For oblique photography, tests were made with different lenses at various altitudes and degrees of camera depression; a table of proper exposure intervals was worked out for different heights and speeds. Further trials were made of Prof. H.L. Cooke's wide-angle-lens camera; and experiments were made in taking stereoscopic pairs of photographs "with very interesting results."

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(11) Aerial photography required considerable skill on the part of the pilot in flying straight and level, and in keeping the altitude and "tilt" of the aircraft within reasonable limits.

In addition to this experimental work Ottawa air station did some photographic operations, totalling 27 hours, to take pictures of the principal water power sites in eastern Ontario and western Quebec, canal systems and major harbours in the same area, and large manufacturing plants, pulp and paper mills, and water power developments. The latter series of photographs was made for the Government Exhibition Commission for display at the British Empire Exhibition.

At the end of the flying season the station was moved to the repair depot on Victoria Island to work on the overhaul of aircraft and equipment through the winter months.

Dartmouth

The station at Dartmouth was much more active than in previous years. S/L Shearer's staff of two officers and ten airmen made 41 flights for a total of 92 hours, most of the work being on photography in the first extensive programme undertaken in the maritimes. The major tasks were two mosaics for the Topographical Surveys Branch, one (24.30 hours) showing the sea coast from Brule harbour to Knoydart Point, and the other (14.10 hours) covering a 64-square mile area in the vicinity of New Glasgow. Hydro-electric power developments on various rivers and watersheds were photographed for the Water Powers Branch, and in another operation a series of obliques was taken in the Annapolis valley from Windsor to Digby. The obliques, requested by the Soldiers' Settlement Board and the Topographical Surveys Branch, were used to give detailed information about cleared land areas in the district which was not shown on existing maps and which it would require much time and expense to secure by ground survey. The photographs were of great value in planning closer settlement in the valley. Some minor photographic operations were undertaken for the Halifax Town Planning Board and other local bodies.

The Post Office Department was now beginning to consider air mail service to some communities and asked the Air Force to investigate the possibility of operating an air service between the mainland and the Magdalen Islands. Late in August a flying-boat flew from Charlottetown to Grindstone Harbour, gathered much information about landing facilities at different seasons and ice conditions on the shore during the winter, and returned to the mainland a few days later. The whole reconnaissance required 6 1/2 hours of flying.

Research

The main theme of aeronautical research by the RCAF and the Air Research Committee was naturally the problem of winter flying. W/C Stedman prepared a report on "Operation of Aircraft and Aircraft Engines under Winter Conditions in Canada,"(12) in which he pointed out that routine flights had been made at High River "throughout the coldest weather without any insurmountable difficulties being encountered." The pilots were instructed to climb to 10,000 feet (i.e. 13,000 feet above sea level) and fly about until they were satisfied that the flight could be continued;

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(12) Printed as Appendix E to Report on Civil Aviation, 1923; pp. 50-56.

after landing, they submitted written reports of the temperatures encountered and any significant items. "The unanimous opinion has been that there is nothing difficult about this work, after the engine has once been started, if the pilot is properly clothed and the cockpit is well screened."

Prof. Robb at Edmonton had done much work on the problem of cold weather starting of engines, and from his research a definite routine procedure had been developed. He had also made tests of the types of radiators most suitable for winter flying. Air-cooled engines were preferable, but the only engines of this type then available were low-powered rotaries, so that it was necessary to continue using water-cooled engines with an anti-freeze mixture. A mixture of denatured alcohol and water was found to be very satisfactory after an ingenious device had been produced by RCAF officers to overcome the low boiling point of this coolant.

In other phases of this research the effects of temperature upon rigging and rubber shock-absorber cord had been studied, and major improvements had been made in the design of aircraft skis. Experimental skis had also been built for the new Vickers "Viking" amphibian, but they were excessively heavy due to the height of the axle from the ground.

Chapter VIII

A. Parliament 1924

Although 1924 was a major turning-point in the history of the RCAF - its "official" birth as a permanent component of Canada's defence forces - air matters received little attention in that year's session of Parliament. The estimates for the RCAF were not brought up until 18 July 1924, just one day before the houses prorogued, and they passed with little discussion. There were three items: a major vote of $1,000,000 for maintenance, operations and training of the RCAF and the control of civil aviation; a second vote of $300,000 for the purchase of aircraft and equipment; and a supplementary estimate of $261,000 for forest patrol. The first two items were the same as the previous year with a modest increase of $50,000 in the amount appropriated for new equipment. The supplementary item, indicative of the increasing significance of civil operations, brought the total vote to $1,561,000 for the 1924-25 fiscal year, an increase of almost 25% over the previous year.

In the debate on the National Defence estimates, Miss Agnes MacPhail began a campaign, which she was to continue for many years, against the appropriations for cadet training and the Royal Military College. This widespread anti-militarist feeling was reflected in the remarks of Mr. E.M. Macdonald, the new Minister of National Defence, when he explained to the house the item for new aircraft and equipment. The air service, he pointed out, was "hardly military in its character; it performs services for all the departments." The aircraft had now grown very old, some were out of commission, and the loss of twelve in a fire at Camp Borden had "almost paralyzed the service." New aircraft were needed, particularly for the increased work being done for the Department of the Interior.

If the minister's reference to the civil aspect of the air force was intended to mollify the pacifists in the house, it provoked an opposite reaction from one member. Mr. D. Sutherland, the member for Oxford South Riding, protested that it was not fair "to include the air service as at present constituted under national defence."

> "..... The air service of this country to-day has been degraded to the position of being hired out to the provinces for fire ranging purposes..... if the government are going to continue catering to an element in this House who apparently have not backbone enough to stand up and admit that they are going to defend themselves when necessary, I think we should know it.... I must protest here.... against crippling everything in the nature of national defence in this country, and then making the pretence that we have a branch of the government which merits the dignity of such a title."

Except for this interjection there was little discussion of the air force estimates and the items passed quickly as the house hurried to conclude its business before prorogation.(1)

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(1) Hansard, 1924 Session; Vol. V, pp. 4816-18.

Although one may not agree with Mr. Sutherland's language, the statement that the RCAF, as constituted in 1924, was not a "national defence" force was basically correct. It was neither organized nor equipped for a defence role; very little of its flying training, as distinct from ground training, was for a military role, and its flying operations were for "national service" rather than "national defence." Nor would national sentiment at the time have wished it otherwise; wars had ended, defence expenditures were unnecessary. On the other hand, the civil operations which Mr. Sutherland regarded as "degrading" were actually "a great asset" to the air force. They gave it a raison d'être in halcyon days when defence requirements seemed not only superfluous but wasteful; and they had the further great merit of showing that the air force, unlike the navy and the army, could be of major practical value to the country in days of peace, as a force for national service, and not merely for defence.

Civil operations were a great asset to the air force in another way also:

"Apart from the direct value of the training in flying under varied conditions; in photography, navigation and observation duties; in wireless communication and in the maintenance of aircraft and engines; work of this kind strengthens the initiative and resources of the officers and men in a way that no programme of routine training can possibly do. From the narrowest service point of view, therefore, and neglecting altogether their undoubted value to the community as a whole, civil operations are well worth while. The opportunity of service they bring is welcomed by every member of the force."(2)

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(2) Report on Civil Aviation, 1924; p. 43.

B. The "Birth" of the Royal Canadian Air Force

The two years from 1 April 1922 to 1 April 1924 were a transition period in the history of the Canadian Air Force. Originating as one branch - the military arm - of the Air Board, with non-permanent status and refresher training role, the CAF in the months after April 1922 gradually absorbed the other civil branches and roles of the Air Board. It acquired a semi-permanent status, and became a component of the new Department of National Defence, was honoured with the distinction "Royal", and adopted the motto, uniform and insignia of the Royal Air Force. Through these months Air Headquarters in Ottawa was engaged in drafting new regulations and orders for the RCAF to replace the original regulations of 1920. The work was finally completed and on 1 April 1924 the new King's Regulations and Orders for the Royal Canadian Air Force became effective.(1) This date, the termination of the transition period and the emergence of the RCAF in its new status as a permanent component of Canada's defence forces, is regarded as the official birthday of the service.

KR and O of 1924 divided the RCAF into two major components, an Active Air Force and a Reserve Air Force. The latter was to consist of qualified officers and airmen who were liable to be called out for such training as might be prescribed; their period of service was to be set by Governor-in-Council.(2) The Active Air Force was subdivided into a Permanent Active Air Force and a Non-Permanent Active Air Force, the term of peace-time service for both being three years. The PAAF was composed of officers and airmen "permanently embodied or employed for continuous service." It was available for general service (i.e. "any Air Force service that may be required") and was "maintained for the instruction" of the NPAAF. The latter was comprised of "such units or detachments and other formations as are from time to time named by the Governor-in-Council." Due to financial limitations, however, no Non-Permanent units were formed until more than eight years later, nor was any training provided for members of the Reserve.

The RCAF was administered by a Director who was responsible to the Chief of Staff and was an associate member of the Defence Council. In addition to the control exercised by the Army Chief of Staff, the local District Officers Commanding were charged with "the administration of the maintenance of discipline in units or detachments of the Royal Canadian Air Force stationed within the area of each Military District."(3)

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(1) PC 353 of 4 March 1924. It had originally been proposed (PC 76 of 15 January 1924) that the new Pay and Allowance Regulations should become effective on 1 March 1924; because this date did not allow "reasonable notice" to the personnel of the RCAF the date was amended to 1 April 1924, the beginning of the fiscal year (PC 311 of 27 February 1924). KR and O were published in a supplement to The Canada Gazette on 15 March 1924 pp. 1-108.

(2) No appointments to the Reserve were gazetted until May 1928 when G/C Scott retired from active service.

(3) KR and O 1924, para. 30 A. Their duties were set forth in detail in para. 54.

Unlike the old CAF, which had been set up as a non-permanent organization for refresher training, the new RCAF consisted of officers and airmen who were making aviation "their profession for life", just like their comrades in the RCN and the Army. This change in status is reflected in the retirement ages for officers:(4)

	General List		Non-Flying List	
	CAF	RCAF	CAF	RCAF
P/O and F/O	30	40	30-32	45
F/L	32	40	34	50
S/L	34	45	36	55
W/C	36	48	38	60
G/C	38	55	40	63

The rank structure of the new service contained several unusual features. The highest rank was that of "Marshal of the Air", the title adopted by the RAF in 1919 when the change-over was effected from Army to Air Force designations; it was later changed to "Marshal of the RAF". An alternative rank of "Observer Officer" was coupled with that of "Flying Officer". Airmen ranks introduced the new titles of "Leading Aircraftman", "Aircraftman 1st Class" and "Aircraftman 2nd Class" in lieu of "Air Mechanic", and provided for two classes of Warrant Officers or Sergeant-Majors. Provision was also made for a new rank of "Boy".(5) In contrast to the CAF, aliens could not be enlisted in the RCAF; all airmen were required to be British subjects.(6) With respect to dress, it was prescribed that airmen were to carry canes when walking out.(7) The origin of the "RAF moustache" which flourished during the Second World War is to be found in the provision that the face was to be shaven except the upper lip which was to be either completely shaven or entirely unshaven.(8) Good conduct badges were authorized, but apparently were never actually brought into use in the Canadian service.(9)

The precedence of the three services was formally established by ranking the RCAF after the RCN and the Canadian Army.(10) The persistence of naval tradition in the air service, as well as an indication of the extensive use of marine craft, is reflected in the detail given to "salutes in boats."

In general the 1924 version of King's Regulations and Orders for the RCAF was based upon that of the RAF and the United Kingdom Air Force Act, and the organization, training and equipment of the Canadian service were to follow the example of the RAF so far as conditions would permit.

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(4) KR and O 1924, para. 257A.
(5) KR and O 1924, paras. 282 and 1767.
(6) Ibid., para. 269A.
(7) Ibid., para. 1714.
(8) Ibid., para. 1696.
(9) Ibid., Appendix VII.
(10) Ibid., para. 1768.

The administrative structure of the new RCAF followed the same pattern as that set up in 1922. The force was administered by a Director, R.C.A.F., who was responsible to the Chief of Staff. Under the Director were three Assistant Directors for Air Staff and Personnel, Supply and Research, and Secretary. The Air Staff and Personnel branch was subdivided into four sections headed by Staff Officers for Personnel, Training, Civil Operations, and Intelligence.(11) Under the Assistant Director, Supply and Research were two sections for technical development and research, and equipment and supply. The third Assistant Director served as secretary and was also responsible for the preparation of Air Force estimates, reports on the work of the Air Force, the control of civil aviation, administration of the civil staff, and other civil duties. A permanent officer was appointed to this branch to serve as Controller of Civil Aviation.

W/C W.G. Barker relinquished the position of commanding officer at Camp Borden in January 1924 when he was posted to Air Headquarters in Ottawa to take over the office of Acting Director from W/C J.L. Gordon on that officer's departure overseas to attend RAF Staff College. Barker continued as Acting Director for six weeks after the new regulations went into effect on 1 April 1924; then he followed Lindsay Gordon overseas to become RCAF Liaison Officer at the Air Ministry for about a year.(12) W/C J. Stanley Scott, who had just returned from Staff College, succeeded Barker as Acting Director on 19 May 1924. He was promoted to group captain six weeks later and became full Director on 1 April 1925, holding that position until he retired from the service in February 1928. The positions of Assistant Directors in April 1924 were held by S/L G.O. Johnson (Air Staff and Personnel), W/C E.W. Stedman (Supply and Research) and Mr. J.A. Wilson (Secretary).

Personnel of the RCAF, 1 April 1924

On the formation of the new RCAF all commissions which had been granted in the CAF lapsed and new appointments were promulgated. The first list(13) named 66 officers who were appointed to commissions in the RCAF on its re-organization on 1 April 1924; of these, 62 were in the Permanent Force and four in the Non-Permanent. Fifty-two of the Permanent officers were on the General List, including 43 pilots, four technical officers and five photographic officers. The ten Non-Flying List officers were all in the stores branch. Three of the Non-Permanent officers were attached to the Permanent Force for full-time duty. By rank the composition of the new RCAF was:(14)

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(11) In 1925 a fifth Staff Officer for Administration was added to this branch to handle the revision and promulgation of all Air Force regulations which previously had been the responsibility of the S.O. Personnel.
(12) The Liaison Office had been closed in June 1921 due to financial limitations and was reopened early in 1924.
(13) AP and R 18 of 28 April 1924, published in "The Canada Gazette" on 7 June 1924.
(14) Officers holding brevet or temporary rank have been counted under that rank.

PERMANENT ACTIVE AIR FORCE

	General List			Non-Flying List	Total
	Flying	Technical	Photog.	Stores	
W/C	4	1			5
S/L	8	1			9
F/L	16	1		2	19
F/O	15	1	2	2	20
P/O			3	6	9
Total	43	4	5	10	62

NON-PERMANENT ACTIVE AIR FORCE

S/L	1
F/L	3
Total	4

The officers were distributed among the units as follows:(15)

RCAF Headquarters (14)

W/C W.G.Barker (Acting Director)
W/C E.W. Stedman (Asst. Director, Supply and Research) (Technical)
S/L G.O. Johnson (Asst. Director, Air Staff and Personnel)
S/L G.M. Croil
S/L W.R. Kenny
F/L A.T.N. Cowley
F/L G.E. Wait
F/L F.J. Mawdesley (brevet rank)
F/O A. Ferrier (Technical)
F/L S.G. Tackaberry (Stores)
P/O W.E. Baker (Stores)

F/L H.R. Stewart (Non-Permanent, attached to Permanent)

W/C J.S. Scott (at R.A.F. Staff College)
W/C J.L. Gordon (at R.C.A.F. Liaison Office to attend Staff College)

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(15) In addition to the 64 officers shown in this tabulation there were two others appointed to commissions on 1 April 1924 who were not posted to units. The appointment of F/L R.S. Grandy was subsequently cancelled as he was engaged on commercial flying at the time; he was reappointed to the Permanent on 1 January 1925 and posted to Camp Borden. The fourth officer appointed to the Non-Permanent RCAF on 1 April 1924 was F/L A.C. Snow who had been armament officer at Camp Borden for a year from February 1923 to March 1924. Unlike the other Non-Permanent officers he was not attached to the Permanent Force for duty.

RCAF Station Camp Borden (20)

W/C L.S. Breadner (temporary rank; in command)
S/L N.R. Anderson
F/L G.E. Brookes
F/L R.J. Grant (Technical)
F/L G.V. Walsh (Adjutant)
F/L R. Collis (brevet rank)
F/L H.W. Hewson (brevet rank)
F/L F.C. Higgins (brevet rank)
F/O G.F.M. Apps
F/O F.S. Coghill
F/O J.L.E.A. deNiverville
F/O D.A. Harding
F/O F.V. Heakes
F/O T.A. Lawrence
F/O A.L. Morfee (Photographic)
F/O G.K. Trim
F/L G.J. Blackmore (Quartermaster)
F/O F.J. Crossfield (Stores)
F/O A.H. Wylie (Stores)

S/L A.B. Shearer (Non-Permanent, attached to Permanent)

RCAF Station Winnipeg (9)

S/L B.D. Hobbs (in command)
F/L H. Edwards
F/L L.F. Stevenson
F/L B.N. Harrop (brevet rank)
F/O L.R. Charron
F/O K.M. Guthrie
F/O G.R. Howsam
P/O D.J.R. Cairns (Photographic)
P/O N.F. Mossop (Stores)

RCAF Station High River (7)

S/L A.A.L. Cuffe (in command)
F/L A.A. Leitch
F/O A. Carter
F/O C.H. Dickins
F/O E.G. Fullerton
F/O G.A. Mercer
P/O N.E. Sharpe (Stores)

RCAF Station Vancouver (5)

S/L A.E. Godfrey (in command)
F/L E.L. MacLeod (temporary rank)
F/O A.H. Hull
P/O C.J. Duncan (Photographic)
P/O F.B. Gillespie (Stores)

RCAF Station Ottawa (3)

F/L C. McEwen (in command)
F/L J.L.M. White (brevet rank)
P/O J.H. Hector (Stores)

RCAF Technical Depot (3)

S/L D.C.M. Hume (Technical)
P/O A.J. Ashton (Stores)

F/L A.L. Johnson (Non-Permanent, attached to Permanent, for duty at Canadian Vickers, Montreal)

RCAF Photographic Section (2)

F/O E.R. Owen (in command) (Photographic)
P/O C.C. Walker (Photographic)

RCAF Station Dartmouth (1)

S/L J.H. Tudhope (brevet rank; in command)

The great majority of these officers had been associated with the Canadian Air Force, or its parent body the Air Board, since the earliest days of 1920 and 1921 - 33 of them were "charter" members of the CAF with commissions dated 18 February 1920, and 17 more joined either the CAF or the Air Board in 1920 or 1921. Ten more began their service in 1922, and six more in the following year or early 1924 - F.V. Heakes and A.C. Snow in February 1923, D.C.M. Hume in August 1923, B.N. Harrop and R. Collis in September 1923, and G.F.M. Apps who received a commission in March 1924, only a fortnight before the reorganization of the RCAF.

Thirty-three - one half - of the original officers of the RCAF subsequently rose to air rank: A/Cs A.J. Ashton, R. Collis, R.J. Grant, A.H. Hull, A.L. Johnson, E.L. MacLeod, N.F. Mossop, J.S. Scott, S.G. Tackaberry, A/V/Ms N.R. Anderson, G.E. Brookes, A.T.N. Cowley, A.A.L. Cuffe, J.L.E.A. deNiverville, A. Ferrier, A.E. Godfrey, J.L. Gordon, K.M. Guthrie, F.V. Heakes, G.R. Howsam, W.R. Kenny, T.A. Lawrence, C. McEwen, A.L. Morfee, A.B. Shearer, E.W. Stedman, L.F. Stevenson, G.E. Wait, G.V. Walsh, A/Ms G.M. Croil, H. Edwards, G.O. Johnson, and A/C/M L.S. Breadner.

Some weeks after the original list was published a second list appeared appointing provisional pilot officers for training at Camp Borden in the summer of 1924.(16) Six of the P/P/Os, who were returning for their second term, received commissions in the Non-Permanent, General List, that were dated retroactively to 1 April 1924.(17)

On 31 March 1924 the 263 airmen then serving in the RCAF were automatically discharged, and those who wished to continue in the new Permanent Force were re-enlisted as AC2s.(18) The new

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(16) AP and R No. 23 of 7 June 1924, published in "The Canada Gazette" for 5 July 1924.
(17) The six cadets, C.M. Anderson, E.J. Durnin, H.M. Durnin, B.C.C. Glynn, C.R. Slemon, and W.C. Weaver, did not report to Camp Borden until 15 May 1924.
(18) Distribution of airmen at 31 March 1924 was: Air Headquarters 16, Camp Borden 120, Vancouver 21, High River 22, Winnipeg 37, Ottawa (including Technical Depot) 23, Roberval 1, Dartmouth 13, Photo Section 10. See Weekly Order 13/24.

rates of pay were in some instances lower than they had been previously and as a result some airmen elected to return to civil life. Others were over age or medically unfit. The total number who, for one reason or another, did not choose to re-engage was 66 (46 married men and 20 single men).(19) These losses were compensated by new enlistments, and the initial strength of the Permanent Force on 1 April 1924 was 262 airmen. New service numbers were now allotted, using a block system with one to 200 for Air Headquarters (including the Photographic Section), 201 to 400 for Vancouver, 401 to 600 for High River, 601 to 800 for Winnipeg, 801 to 1000 for Ottawa (including the Technical Depot), 1001 to 1200 for Dartmouth, and 1201 to 1400 for Camp Borden.(20) Distribution of airmen on reorganization of the RCAF on 1 April 1924 was:(21)

Station	WO1	WO2	FS	Sgt.	Cpl.	LAC	AC1	AC2	Total
Air Headquarters	1	1	1	3	2	3	3		14
Phot. Section				1		3	2		6
Camp Borden			7	7	11	8	17	22	72
Vancouver			1	3	3	7	2	3	19
High River			1	2	3	5	4	3	18
Winnipeg			1	3	5		7	19	35
Ottawa		1	1	3	3	2	4	5	19
Tech. Depot			1	1		1	1		4
Dartmouth			1	1	1		1	3	7
Total	1	2	14	24	28	29	41	55	194

In addition to Air Headquarters in Ottawa the RCAF in April 1924 had a training centre at Camp Borden, a central technical depot and a photographic section in Ottawa, and five stations at Vancouver (Jericho Beach), High River, Winnipeg (with three operational sub-bases), Ottawa (Rockcliffe) and Dartmouth (open only during the summer months). Vancouver, High River, Winnipeg and Dartmouth stations were well equipped for their civil government work, but conditions at the other bases were less satisfactory. The aerodrome at Ottawa was small and somewhat difficult of approach for landplanes, while the high bank of the river made the cost of a slipway for seaplanes prohibitive; the site was also difficult of access to the city. The winter headquarters and repair site on Victoria Island was acceptable as a temporary measure, but it was not suitable as an air station because of its proximity to the Chaudiere Rapids and the difficult approach to the slipway; nor were the buildings suited for the construction or storage of aircraft. More adequate accommodation was needed to provide a main workshop and stores depot under the close supervision of the technical and equipment staff at headquarters.

The situation at Camp Borden caused even more concern. Developed during the war for large-scale training, the station was too large for the small peace-time establishment of the RCAF. Maintenance charges were altogether disproportionate; the large temporary construction buildings were expensive to keep

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(19) See Hansard, 1924 Session; Vol. II, pp. 1437-8.
(20) See Weekly Order 28/24. Numbers were assigned on the basis of the airman's unit on enlistment.
(21) Weekly Order 1/24 of 1 April 1924 listed promotions to rank of sergeant and above for 42 airmen.

in repair, while the fuel bill for heating them was a heavy charge on the small Air Force appropriation. Furthermore, the site was isolated from centres of population and difficult of access with inferior transportation facilities. This meant heavy maintenance charges on the sidings from the main railway lines and additional expenses for the maintenance of roads into the camp. For these reasons the department was already looking for accommodation on a more suitable scale with smaller maintenance charges. Plans had been prepared to move the training base to Long Branch near Toronto, a more convenient location which would be easier of access and cheaper to maintain, but so far no funds had been made available for the new site. These must be provided "in the near future, however, if efficient facilities for the training of officers and mechanics for the Force are to be provided."(22)

The new pilot training scheme, now in its second year, was extended in 1924 to include "gentleman cadets" from RMC as well as cadets from university COTCs.(23) Thirty-one provisional pilot officers were appointed for training in 1924, including six second term cadets and 25 first term; eight of the first term cadets came from RMC and the other 17 from COTCs.(24) The RMC cadets, because of the later termination of their college year, did not report until June, a month after their university comrades. In addition to the eight RMC cadets appointed as P/P/O for first term training, four RMC graduates, A.P. Campbell, B.G. Carr-Harris, R.M. Carr-Harris and F.G. Wait, were appointed to outright commissions as pilot officers in the Permanent Force on 16 June 1924 and trained as pilots during the summer and autumn. Nine of the first term cadets dropped out after the first year; another member of that course, P/P/O A.W.B. Stevenson, was killed in a flying accident in his third term. Five of the 1924 entry, W.H. Irvine, B.F. Johnson, R.E. McBurney, J. Moar, and W.D. Van Vliet, completed the three-term course, qualified for their wings and saw service with the RCAF. After the summer course ended, early in September 1924, four of the second term cadets, C.M. Anderson, E.J. Durnin, C.R. Slemon and W.C. Weaver, continued training at Camp Borden, finishing their third term in December. They received their pilot's flying badge as the first graduates of the P/P/O training scheme. Three of the RMC pilot officers, A.P. Campbell, B.G. Carr-Harris and F.G. Wait, also continued their training to qualify for their wings at the same time.

KR and O of 1924 had envisaged a training scheme for "boys" to become tradesmen in the service, but lack of funds deferred initiation of this scheme for three years. In the interim, trained mechanics were recruited so far as possible from civil life to fill the technical ranks of the force.

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(22) DND Report for the fiscal year ending 31 March 1924, p. 48. The item was repeated in the 1924-25 Report, pp. 49-50.
(23) RMC candidates could enter at 17 plus years of age, whereas COTC candidates were required to be "under 21". The original plan was to have only 20 candidates in 1924, ten nominated by universities and ten by RMC. See DND Report, 1924, p. 51.
(24) The six second term trainees were appointed P/P/Os in the Non-Permanent effective 1 April 1924; the appointments of the first term university cadets were dated 1 May and the RMC cadets 17 June.

As mentioned previously, W/C Scott completed the course at the RAF Staff College in the spring of 1924 and became the first RCAF officer to qualify for "p.s.a.". W/C Gordon had gone overseas to attend the next course. The RAF had also agreed to accept RCAF officers for training at special courses in their establishments "until the numbers employed in Canada justify the establishment of special courses of instruction" within the RCAF. In the years that followed, many Canadian officers attended RAF schools for specialized training in various air and ground subjects. Arrangements had also been made for RCAF officers to receive staff training by attending courses at RMC or other Canadian Army schools.

The importance of combined training with the other services was emphasized in the departmental report for 1924 which, despite General Douhet's doctrines, stated that:

> "Under modern conditions, air co-operation is essential to the success of operations by the land and sea forces. In the same way, independent air operations without the support of the sister services can seldom push home a definite result. Familiarity with the work and organization of the navy and army is therefore essential to the Air Force and vice versa."

To that end, "every opportunity" was taken for combined operations and training with the other services, although peace-time conditions did not permit any long or extended exercises. In 1924 there were seven combined training courses or exercises with the Army and the Navy, involving about 50 hours of flying. These included two artillery co-operation exercises at Esquimalt, another at Dartmouth,(25) a demonstration at the Small Arms School in Ottawa, and staff courses at St. Johns, P.Q., and Sarcee Camp, Alta., as well as a wireless-telegraph course for the RCCS at Camp Borden.

The Royal Canadian Signals had participated in the shoots at Dartmouth and Esquimalt by installing radio telephone sets in the seaplanes, and they also operated the RCAF radio services during the summer and autumn at Jericho Beach, Prince Rupert, High River, Winnipeg, Victoria Beach and Norway House. Four officers and thirty men - more than one-fourth of the Corps' total strength - were employed at these stations.(26)

The total flying by the RCAF during the 1924-25 fiscal year was 3941.45 hours, an increase of almost 90% over the previous year. Service flying, including training, accounted for 1616 hours, or 41% of the total, as compared with 681½ hours (about 33%) in 1923-24. The remainder of the flying time was spent on forest patrol and reconnaissance (1437 hours), aerial survey and

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(25) "The results obtained in the observation of fire (during battle practice at Dartmouth) were reported upon as being extremely rapid and most satisfactory." DND Report 1925, p. 38.

(26) The reduction in Army rates of pay during the year led to a major decrease in strength and the RCCS lost 30 men from its small force. As a result it "was faced with a very difficult task in finding the requisite number of trained personnel required for employment on the Northwest Territories and the Royal Canadian Air Force Radio Stations." Of its total strength of 20 officers and 103 other ranks, six officers and 26 men were employed on the Northwest Territories and Yukon systems, in addition to those serving the RCAF systems. DND Report 1925, p. 33.

and photography (532), fishery protection (150), transportation (98), customs patrol (42), ferrying and miscellaneous duties (66 hours).

The original Permanent peace establishment authorized for the RCAF on 1 April 1924 was 68 officers and 307 airmen. These figures were raised to 70 officers and 337 airmen, effective 1 December 1924,(27) and then, on 1 April 1925, to 95 officers and 375 airmen "permanently embodied or employed for continuous service."(28) The authorized rank structure at each date was:

	1 December 1924			1 April 1925		
Rank	Gen. List	N/F List	Total	Gen. List	N/F List	Total
G/C	1		1	1		1
W/C	5		5	6		6
S/L	8		8	10	1	11
F/L	16	2	18	17	3	20
F/O and P/O	30	8	38	49	8	57
Total	60	10	70	83	12	95

	Tradesmen	Standard	Total	Tradesmen	Standard	Total
WO1	7	1	8	7	1	8
WO2	3		3	3		3
FS	19		19	22		22
Sgt.	49	1	50	54	1	55
Cpl.	58	2	60	82	3	85
Aircraftmen	161	36	197	160	42	202
Total	297	40	337	328	47	375

The actual strength at 31 March 1925 was 379 all ranks, of whom 85 were at headquarters and other units in Ottawa, 168 at Camp Borden, 57 at Winnipeg, 30 at High River, 37 at Vancouver, and 2 at Dartmouth.

In addition to the 62 officers mentioned previously who were appointed to the Permanent Force on 1 April 1924, and the four RMC graduates who were commissioned on 16 June 1924, one other officer received a commission in the Permanent Force in 1924; he was P/O David Tough who was appointed to the Technical Branch on 30 June 1924. In earlier years Tough had served as a warrant officer in the CAF at Camp Borden. In the Non-Permanent Force after the four original appointments and the four P/P/Os who were retroactively dated 1 April 1924, the next appointment was that of R.H. Cross who became a flying officer in the Non-Permanent on 16 July 1924. Ronald Cross was the first airman to rise from the ranks of the RCAF to a commission. After serving with the RNAS and RAF during the war he had been commissioned in the CAF in 1920 and completed the usual one month's refresher training.

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(27) GO 54/25.
(28) GO 69/25. The authorized strength of the NPAAF was 67 officers and 130 airmen.

He was then employed as a civilian clerk in the technical stores at Camp Borden and subsequently resigned his CAF commission so that he could be enlisted as an airman clerk general early in 1923. When the RCAF was re-organized on 1 April 1924 Cross was re-enlisted as an acting corporal at Camp Borden and then, some weeks later, discharged on appointment to a commission. Following some service at Ottawa, he was posted back to Camp Borden early in January 1925 to attend the winter flying training course.

On the morning of 24 February 1925 F/O Cross was receiving instruction on an Avro from F/L J.L.M. White when the aircraft collided with another Avro flown by F/O A.L. Morfee. The latter pilot was able to land safely, but White's Avro crashed and both occupants were killed. Joseph White was one of Canada's great fighter pilots. A native of Halifax, he went overseas with the Canadian Army and later transferred to the Royal Flying Corps. In April 1918 he was posted to No. 65 Squadron in France and quickly distinguished himself in combat and on reconnaissance work, winning the DFC and Bar and the French Croix de Guerre. When the CAF was formed, Capt. White was appointed to a commission as flight lieutenant, and served also as a member of the Maritime Provinces Branch executive committee, and as officer commanding No. 6 (Inactive) Squadron. After service at Camp Borden in 1921 he was posted to Dartmouth for duty in July 1923, and upon re-organization of the RCAF on 1 April 1924 was transferred to Ottawa and thence to Camp Borden where he served as an instructor until his death.

F/L White and F/O Cross were the first flying casualties in the RCAF. Two other deaths were reported during the fiscal year 1924-25, one due to pneumonia and the other to appendicitis.

C. Civil Government Operations 1924

The programme drafted by the Inter-Departmental Conference for the 1924 season provided for a continuation and expansion of the services supplied by the air force in previous years, i.e. forest patrol and survey, photography, fishery and customs patrol, and transportation. The several branches of the Department of the Interior - Forestry, Topographical Surveys, National Parks, and Water Powers - were responsible for most of the items on the programme, with other operations planned for the Departments of Customs, Marine and Fisheries, and Indian Affairs. The only provincial government now being served was British Columbia which arranged for some forest patrols on a repayment basis when the fire hazard was at its peak.

To these other branches of the government the air force owed a debt of gratitude for their help in its early endeavours.

> "They have provided the opportunity for useful work, have placed their knowledge freely at the disposal of the Air Force, have helped (it) in (its) initial difficulties, and have shown the greatest patience when failures have occurred and service has not been forthcoming. Success cannot always be ensured; but, as experience is gained and scientific understanding of the problems of flight becomes clearer, the percentage of failures becomes steadily less."(1)

With a larger appropriation available for civil operations the RCAF was able to increase its flying in 1924 by almost 75% over the previous year, the total on civil government work being 2472 hours, or 1050 hours more than in 1923. All the "civil" stations - Vancouver, High River, Manitoba, Ottawa and Dartmouth - reported increases, the most significant being that of the Manitoba bases, Victoria Beach and Norway House, which boosted their flying hours almost 250% and supplanted High River as the most active operational area. This was in considerable measure due to the introduction of the new Vickers "Viking" amphibians, six of which were concentrated in the Manitoba area for the 1924 season with "an immediate increase in efficiency in the forest fire protection and aerial survey work."(2) The two Manitoba bases flew 1183 hours, or almost one-half of the total civil government flying; High River did 673 hours, or somewhat more than one-quarter of the total, and the balance was divided between Vancouver (324 hours), Ottawa (180), and Dartmouth (112 hours).

Forestry patrol continued to be the largest item in the civil programme, accounting for 1366 hours or 55% of the total flying. Most of this work was done at Victoria Beach and Norway House (940 hours): High River, because of the low fire hazard that season did only 382 hours; and Vancouver did a small amount during the dangerous period. The scale of patrols depended upon the degree of fire hazard in the various districts. In Alberta the aircraft were used only for the detection of fires; their suppression was left to the well-organized ground forces.

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(1) Report on Civil Aviation, 1924; p. 85.
(2) Ibid., p. 47. The other two "Vikings" were based at Vancouver and Ottawa.

The efficiency of this air-ground system was demonstrated by the fact that in four years of forest patrols from High River "no fire originating in the reserves has spread beyond the control of the nearest fire ranger."(3) In Manitoba, where the distances were much greater and settlements few, the aircraft were used for both detection and suppression of fires. A fire ranger was normally carried on the patrols; if a fire was discovered of no great magnitude and near a landing-place, the aircraft would put down while its crew helped the ranger to deal with the blaze. If, however, the fire had gained a good hold, or was difficult of access, the flying-boat would land the ranger as near as possible to the scene and then return to base for more fire-fighters, hose, pumps and equipment. If necessary the aircraft would keep the fire-fighters supplied for several days until the situation was under control.

In addition to detection and suppression the forest patrols were also useful for preparing inventories of forest resources in unexplored districts. Foresters made sketches from the air which they supplemented, when necessary, by more detailed examination on the ground.

> "In this way an inventory can be made over a large area in a remarkably short time which will give general information as to the value of the timber, its distribution, size and accessibility, which would require, if made on the ground, infinite labour, great expense and much time. Experience has shown that inventories prepared by a forest engineer with experience in this class of work are remarkably accurate and compare favourably with any but the most minute ground cruises. The great advantage of this method is that the forester can, by seeing the whole district in a bird's-eye view from the air, discriminate at once between the districts where there is merchantable timber and those which are of little value. He can therefore concentrate on the former and neglect the latter, whereas if the work is done only on the ground, this would not be possible, as the whole area would have to be treated alike in making the cruise."(4)

It was in 1924 that the programme to photograph Canada from the air really began. In earlier years, an experimental period during which the techniques of aerial mapping were being worked out, the total area photographed had been less than 4,000 square miles. In the 1924 season 40,000 square miles were covered by oblique and vertical photography for mapping and other purposes; 508 hours, about 20% of the year's total, were flown on this work. Most of the photography, 27,000 square miles, was done in north-western Ontario, northern Manitoba and Saskatchewan; about 10,000 square miles in Alberta, 3,000 in Nova Scotia, and 200 in eastern Ontario.

The experience of the earlier years showed that through the use of aerial photography the government survey services could reduce their ground work by more than half and, at the same time, they could produce maps infinitely more complete and accurate, in much less time, than by the older methods. For exploratory survey

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(3) Ibid., p. 48.
(4) Ibid., p. 48.

of undeveloped districts, where the aim was to obtain a good map showing only the general features of as large an area as possible at the lowest cost, oblique photography was employed. For urban areas and thickly populated districts, where accurate detail was essential, vertical photography was preferred; it required more flying time than oblique work and greater care in piloting straight and level at constant altitude to obtain the necessary overlap.

The Fairchild aerial camera had now supplanted war-time types as standard equipment for photographic operations. An automatic film camera, it carried a magazine with a 75-foot roll of film, sufficient for about 125 seven-by-nine inch exposures. An electric drive set and released the shutter and wound the film after each exposure. The drive could be adjusted for different time intervals as required by the speed and height of the aircraft, the overlap desired, and the length of the lens.

On photographic operations in the maritimes weather conditions were a much greater handicap than in western Canada. Cloud and fog often prevented work for many days at a stretch, and advantage had to be taken of every moment of suitable weather. In the prairies, on the other hand, although haze and smoke could be major obstacles, long spells of continuously clear weather could be counted on, with confidence, during the summer months. For oblique photography it was desirable to have a clear horizon line on the negative, and a heavy anti-blue filter was used to overcome as far as possible the effect of haze.

Fishery protection patrols off the British Columbia coast were the third largest item on the 1924 programme. A detachment of two HS2L flying-boats temporarily based at Prince Rupert logged 150 hours on this work. Transportation flights for many different purposes, customs patrols, tests and experiments, and "service flying" accounted for the balance of the time flown at the civil operations bases of the RCAF.

Vancouver(5)

The staff of RCAF Station Vancouver consisted of S/L A.E. Godfrey (in command), F/L E.L. MacLeod and F/O A.H. Hull (pilots), P/O C.J. Duncan (photographic officer), P/O F.B. Gillespie (equipment officer), and 21 airmen; three aircraft, a "Viking" and two HS2Ls, were in service. Construction of the wireless hut at Jericho Beach was completed early in the year after which an officer and four men of the RCCS reported for duty as wireless operators to instal equipment in the hut and the aircraft. The station pigeon loft was stocked with 36 birds.

Flying during the year totalled 324 hours, of which about 81 were on service activities and the balance on civil government operations. The major role of the station was now fishery

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(5) Although the five bases at Vancouver, High River, Winnipeg, Ottawa and Dartmouth were engaged essentially in civil government work, it should be remembered that they were RCAF stations manned by service personnel under air force discipline. The aircraft now carried service markings - roundels on fuselage and wings, blue, white and red stripes on the rudder - as well as the civil registration letters. Government aircraft were registered in the G-CY--series; only the last two letters of the registration were now painted on the aircraft.

protection which had been expanded from 72 hours in 1923 to almost 150 hours in 1924. For this work a detachment of two officers (F/L MacLeod and F/O Hull) and five airmen with two HS2Ls was based at Prince Rupert from 10 July to 21 September, during which time 81 flights were made. A boathouse at Seal Cove, which had been used the previous year, served as a workshop for repairs as well as for refuelling. The two flying-boats had been fitted with wireless and a detachment of the station's RCCS personnel travelled to Prince Rupert by boat to set up temporary wireless facilities there. The equipment was not put into service, however, until late in the season when foggy and rainy weather frequently interfered with its use. The fog and clouds often lay so close to the water that the aircraft had to fly "on the deck", making it impossible to lower the wireless aerial. Nevertheless when the weather permitted successful communication was established by telephone and morse.

The Prince Rupert fishery patrol area extended from the Alaskan boundary southward to Cape Caution. Between these two points there were so many thousands of miles of coastline and intricate waterways that the fishery patrol boats found it almost impossible to cover the area completely. The use of aircraft with their greater range, speed and visibility added immeasurably to the efficiency of the patrol system. In practice, routine flights were made during the weekends when fishing was banned, one HS2L patrolling over the Naas and Skeena river areas in the north while the other covered the southern area, flying either from Swanson Bay or Bella Bella. On one such weekend patrol one of the flying-boats covered 920 miles in 14.57 hours, made 23 landings and took 115 photographs between Friday morning and Sunday evening.(6) A three-day visit was also paid to the Queen Charlotte Islands, during which the flying-boat completed in 40 minutes a journey that would have required at least 15 hours by motor-boat. In addition to routine patrols to curb illegal fishing, the fishery officers also used the aircraft to keep in close touch with widely separated points in their districts and to check the movement of their patrol boats; some photography was also done over spawning grounds in certain areas.

Although it was an old war-time type the HS2L was in many ways well suited for this sort of work thanks to its rugged construction and seaworthiness. "No flying-boat can stand more rough usage or heavy seas and while its aerodynamical qualities are somewhat out of date, it has done yeoman service under hard conditions." The Liberty engines, however, were showing their age; spares were inadequate and as a result engine trouble caused some forced landings which interfered with the efficiency of the service. In a region such as the northern British Columbia coasts where flying was by no means easy due to prevalent fog and rain and uncertain weather, better facilities were essential for handling the aircraft and maintaining their engines.

Customs patrols for the prevention of smuggling were still flown on occasion from Jericho Beach, the total number for the year being 21 flights. These included one four-day trip to co-operate with ships of the RCN in an attempt to apprehend a smuggler suspected of hiding off the coast of Vancouver Island. The value of these preventive patrols was illustrated by a

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(6) For a detailed description of this patrol see Report on Civil Aviation, 1924; p. 53.

flight made in February to escort the "Empress of Asia" out of port. There was reason to suspect that an attempt might be made to transfer narcotics from the liner to high-powered boats, several of which were observed standing by along the ship's course, but the flying-boat gave them no opportunity to pick up any articles from the water. When a roll of tar paper and refuse was thrown overboard from the liner, apparently in an effort to determine how close a watch was being kept from the air, the crew of the aircraft detected the act and landed to examine the material. One of the motor launches displayed "obvious chagrin" at the presence of the flying-boat.

There was no regular schedule of forest patrols, but the provincial government arranged to have flights made, on a re-payment basis, whenever there was a need. Early in May one aircraft was sent off on a three-day trip to drop fire protection pamphlets at lumber camps and other points along the coast as far north as Alert Bay and Nimpkish Lake. Early in July the fire hazard reached its peak and several serious fires broke out. To assist the fire-fighters, F/L MacLeod made several flights during a ten-day period, carrying officers of the provincial forestry service over the scene of the fires so that they could determine their extent and distribute the ground forces to the best advantage. In all, 16 flights totalling 44 hours were made on forest protection.

Once again some experimental flights (about 22 hours) were made for the Department of Agriculture in its investigation of the white pine blister rust. In addition to transportation for officials engaged in the control work, further spore-trapping flights were made, using vaseline-coated slides or water-bottles fitted with a funnel.

Photographic operations from Jericho Beach, apart from some work in connection with the fishery patrols, were limited to a mosaic of the Point Grey municipality.

High River

RCAF Station High River was under the command of S/L A.A.L. Cuffe, who had replaced S/L Croil at the close of the 1923 season. On his staff were F/L A.A. Leitch, F/Os A. Carter, E.G. Fullerton, G.A. Mercer and C.H. Dickins (pilots), and P/O N.E. Sharpe (equipment officer), and 23 airmen. The only landplane base in use for civil operations, High River, was still using the DH4s which had been brought into service in 1920. The total flying on these aircraft during 1924 was 673 hours, more than half of which (382 hours) were on forest patrol. Most of the remaining time was spent on several photographic operations.

The forest area guarded by the patrols from High River extended over 3,000,000 acres in the Crowsnest, Bow River and Clearwater reserves on the eastern slopes of the Rockies. As in previous years, two aircraft were sent out on patrol each morning, one flying north to Eckville and the other south to Pincher Creek. After refuelling at these landing-grounds, the aircraft returned to base in the afternoon. The patrols averaged about three hours in duration, and the pilot reported his position by wireless telephone every 15 minutes. Occasional patrols were made to Rocky Mountain Park, but no regular schedule was maintained over that area because of the limited number of aircraft and the unsuitability of the DH4 for work over the mountains.

The fire hazard was low during the 1924 season due to snow and wet weather in the foothills. Only 12 fires were spotted and thanks to prompt action in dealing with them the areas burned were negligible in extent. "It is safe to say that in no forests in Canada is the fire hazard under better control." A DH4 was lost in the course of the forest patrols when the pilot was caught in a sudden storm while flying over the Porcupine Hills en route to Pincher Creek. The clouds descended over the valley in which he was flying, shutting him in before he could escape or reach a safe landing place. With visibility cut to zero the aircraft collided with the tree tops and became a total wreck. The pilot luckily escaped with minor injuries.

As an adjunct to its forest patrols the station carried out a mail delivery service to the Prince of Wales' ranch in the foothills west of the stations while His Royal Highness was visiting there. The mail arrived at High River by train each day shortly before the fire patrols were due to set out. Arrangements were made with the post office to deliver the mail to the station so that the bag could be dropped at the ranch, in the normal course of the patrol, thus saving a long road journey from the railway. The Prince expressed his appreciation of the service.

In addition to forest patrol High River also carried out an extensive programme of aerial photography, one specially-equipped DH4 being continuously employed on the work. Between 9,000 and 10,000 square miles were photographed in some 230 hours flying. The work began in May in the Vermilion district where 2500 square miles were covered by oblique photography. A 520 square mile mosaic was then made of the Edmonton area, and later in the season the whole Edmonton map sheet, an area of 3,224 square miles, was covered by oblique photographs. The next item in the programme, an area around Wainwright, was hampered by bad weather, and operations were shifted to the Brazeau district which proved to be most difficult to photograph as a large part of it had never been adequately surveyed and landmarks were difficult to find. Existing maps were very incomplete, many large rivers and lakes not being marked, and the whole area was largely muskeg with few possible landing grounds. Most of the photographic work was done for the Topographical Surveys Branch, but there was one operation for the National Parks Branch to take a series of unique mountain views along the new Banff-Windermere highway, including some of the finest peaks in the Canadian Rockies.

An amusing by-product of the aerial photography was that several liquor stills, so it was reported on good authority, were dismantled because the operators believed that the aircraft were specially detailed to look for such illicit operations. In another area the RCAF was given full credit for a sorely needed heavy rain which fell soon after the air party arrived in the district.

The photographic crew had many problems to contend with in their work. It was difficult to maintain constant altitude due to variations in the altimeters carried on the aircraft, and changes in barometric pressure during long flights. Operations from stubble fields, often the only landing ground available, presented other difficulties. After a short time it was necessary to fasten new coverings to the tips and leading edges of the propeller because loose straw quickly cut the wooden blades to pieces; two months of stubble-field landings rendered a propeller useless. An all-metal airscrew, or a metal-tipped one, was needed to stand up to the hard wear encountered on operations away from the main base.

On the whole the DH4 stood up remarkably well under the severe weather conditions experienced while working in the field with no protection except covers for the engine and cockpit. After considerable exposure to wind, rain, hail and snow, however, the varnish which had been applied over the dope on the wings began to rub off in powder form. Also, after heavy rain, water collected in the fuselage and wings and had to be drained off; for weeks the wing fabric was never thoroughly dry nor the inside of the wings free from moisture. For other technical reasons the De Havilland was not satisfactory as a photographic machine. The cockpit was so small that changing magazines on the camera was an exhausting process; the photographer's feet were wedged under the seat and suffered acute discomfort from the cold; the lower wing presented a large blind spot which contributed to directional errors; and in oblique photography the camera diverted the slipstream into the cockpit.

The DH4s had now been in use for over four years and although carefully overhauled at the end of each season, they had little useful life remaining. To replace them, contracts were placed early in the summer of 1924 for five single-seater Avros, fitted with 210 h.p. Wolseley "Viper" engines and equipped with wireless. Smaller and lighter in construction than the DH4, the Avro "Viper" cost less in the first instance, would be cheaper to maintain and, because of its greater ease of control and lower landing speed, would make a better patrol aircraft than its predecessor. The Avros were delivered to High River before the end of the year, and it was proposed to do all the patrol work in 1925 on the new aircraft. Introduction of the Avro would also make it possible to carry out more patrols over Rocky Mountain Park when the fire hazard called for extra precautions. Two De Havillands were to be retained and reconditioned for use as photographic machines over the prairies.

Much experimental work was done at High River in the development of wireless in conjunction with the RCCS staff. Wireless telephony was used on the forestry patrols, in preference to the morse key, and reliable voice communication could be maintained over distances of almost 200 miles. So far only one-way communication, from aircraft to base, was possible, but experiments were being made to develop two-way exchange of speech.

Manitoba

RCAF Station Winnipeg, which embraced the two operational bases at Victoria Beach and Norway House, had now become the largest centre in the RCAF for civil government work. Serving under the command of S/L B.D. Hobbs were F/Ls H. Edwards and L.F. Stevenson, F/Os L.R. Charron, K.M. Guthrie, B.N. Harrop and G.R. Howsam (pilots), P/O J.R. Cairns (photographic officer) and P/O N.F. Mossop (equipment officer), with a staff of 47 airmen. Six of the RCAF's eight "Vikings" were concentrated in Manitoba, three being based at Victoria Beach and the other three at Norway House. The first of these sub-bases did not begin flying operations until 3 June, due to ice and weather conditions; Norway House was opened eight days later and carried out its first patrols on the 13th. Flying continued until 10 October when imminent freeze-up stopped operations for the season. In the four months that they were open the two sub-bases flew 1183 hours. The sub-base formerly used at The Pas was not opened this year because the small number of aircraft available

would not permit efficient service over so large an area.

About 85% of the flying (1020 hours) was for the forestry service on fire patrol, timber cruising and transportation of officials. The area patrolled, comprising 40,000,000 acres of forest land immediately surrounding Lake Winnipeg, was divided into seven sections, three of which were assigned to Victoria Beach (District "A") and four to Norway House (District "B"). At each base two "Vikings" were used for regular "detection" patrols, while the third was kept standing by, ready to carry equipment, supplies and fire-fighters when required for "suppression" work. In the Norway House district, which extended from Berens River north to the Hudson Bay rail line, the fire hazard was not high except in the latter part of July and early August. Ten fires were reported in the course of 243 hours on forest patrol. In the southern district, however, the fire situation was extremely grave and 51 fires were detected by Victoria Beach patrols during 699 hours of flying. August and September were a particularly busy period, the aircraft sometimes being called on to make three flights in a day. There were occasions when all the fire rangers were out fighting fires and were entirely dependent on the aircraft for supplies and communication with their headquarters. At these times, when pilots sighted any new fires they had to organize their own fire-fighting crews and make temporary arrangements to deal with the situation until a ranger was available.

In addition to fire patrols the aircraft were also used for "timber cruising," or aerial forest sketching, to map timber areas, estimate the types, percentage of stands, and average size. Three timber experts who arrived at Victoria Beach late in July spent the next two months engaged on this work, flying on the regular patrols from that base and Norway House and making several special flights as well. The aircraft usually flew at 800 to 1200 feet altitude and made landings when required for closer observation on the ground.

The Manitoba units led in aerial photography, as well as in forestry patrol, with a total of 27,000 square miles recorded on film in over 180 hours of flying. With the exception of about 15 hours, all of the work was for the Topographical Surveys Branch. Dominion Land Surveyors were carried on the photo flights to navigate the aircraft and direct the taking of the pictures.

The most important of the survey operations was one undertaken in July and August by S/L Hobbs and crew; it lasted four weeks and was the "first really long expedition for exploratory survey." The object of the flight was to take oblique photographs of the water courses along three sides of a huge rectangle, proceeding north from The Pas to Pukkatawagan, thence westward along the Churchill River to Ile-à-la-Crosse, with a side trip up the Reindeer River to Reindeer Lake, and finally southward along the Beaver River and its tributaries to reach the Saskatchewan River at Prince Albert. Careful advance planning was necessary as the territory was far beyond the ordinary means of transportation, the most northerly point on the route, Du Brochet at the head of Reindeer Lake, being 1000 miles from the base at Victoria Beach and several hundred miles beyond any rail or steamboat communication. With the assistance of the Hudson's Bay Company and Revillon Frères refuelling caches were laid down along the route; throughout the entire expedition the two companies co-operated most willingly, providing valuable advice and assistance as well as hospitality for the crew at various stopping places.

Even with fuel caches laid down, the crew would have to be entirely self-supporting from the time they left civilization at The Pas until they reached Prince Albert. This meant that, in addition to normal equipment and supplies, the aircraft had to carry emergency rations and a portable canoe. The total load came to 2063 pounds, including 720 pounds for the crew of four, 910 pounds for gasoline (112 gallons) and oil (8 gallons), 227 pounds for emergency rations, the collapsible canoe, spare parts, equipment, ropes, hose, refuelling funnels, etc; and 206 pounds for cameras, magazines, film rolls and other items. The Vickers "Viking" weighed 3800 pounds, with a total permissible all-up weight of 5800. As the planned load was 63 pounds over this limit, the wheels and tailskid of the amphibian were removed, reducing the gross weight to 5663 pounds. Tests showed that the aircraft took off well, but had a very slow rate of climb with so heavy a load.

For photography the "Viking" carried a Fairchild camera fitted in the front cockpit on a machine-gun type mounting which permitted 180 degrees of traverse; when not in use the mounting could be folded back into the cockpit. A wind-driven dynamo supplied power for the camera's automatic drive. The photographs, all oblique, were to be taken at 5,000 feet altitude with the camera depressed sufficiently to bring the apparent horizon about one inch below the top of the picture. At a ground speed of 60 m.p.h. a set of three pictures, one straight ahead, one to the left and one to the right, was to be taken every three minutes.

The expedition - S/L Hobbs, pilot, F/O J.D. Cairns, photographer, Mr. R. Davidson, DLS, navigator, and Cpt. A.J. Milne, mechanic - left Victoria Beach at 1620 hours on 18 July and flew north to The Pas (325 miles) where it arrived at 2010 that evening. Here the final preparations were made and on 20 July the actual operation began. Hobbs had to make three runs before he could lift the heavily-loaded "Viking" from the surface of the Saskatchewan River; then, after climbing to 5,000 feet, he straightened out on the northward course while Cairns started the camera clicking. Three hours and 190 miles later the "Viking" landed at Pukkatawagan and was moored near the Revillon Frères trading post.

Low cloud over the latter part of the route somewhat hampered the photographic work and after reaching Pukkatawagan the crew had to wait two days for good weather before they could set out again on 23 July. Flying westward they followed the Churchill River to its junction with the Reindeer and then turned north up that river to the south end of Reindeer Lake. A landing was made at Rabbit River after a flight of 3.25 hours in which they had covered 200 miles. Some difficulty was experienced in locating the Revillon Frères post at Rabbit River as, unknown to the airmen, it had been moved a few miles down the river.

The expedition remained in this area for a week, using the fuel cache at Rabbit River while they flew 12.50 hours to photograph the whole of Reindeer Lake. One overnight stop was made at Du Brochet at the extreme northern end of the lake. The airmen noted that Reindeer Lake was quite unlike existing maps, with "a mass of intricate waterways spreading in all directions." Weather conditions caused frequent delays as did the camera which "seemed to give constant trouble." When the electrical equipment refused to work properly the photographs were taken by hand crank until this too broke down, due to stripped gears, and had to be repaired. The aircraft and engine

gave little trouble.

The enforced delays at Reindeer Lake gave the crew an opportunity to study the country and its inhabitants. Even in mid-summer the weather was extremely cold at night. The Indians were greatly impressed by their first contact with aircraft. They "would run into their huts or wigwams when the machine was landing and come out, dressed in the most brilliant colours and gaily decorated, when it was taking off. They would stare at the anchored machine for hours at a time; and, when it moved slightly in the wind, they would all get up from where they were sitting and move back, gradually creeping forward until it moved again."

While the airmen were stopping overnight at Du Brochet the Indian agent arrived to pay treaty money. "It was very interesting (S/L Hobbs commented) to compare the time and distances which he had travelled by canoe with those which our machine had already made. His party had been travelling for many weeks and it was anticipated by them that their round trip would run into months before it was completed."

Their work at Reindeer Lake completed, the expedition left Rabbit River on the morning of 1 August, intending to fly to Stanley Mission. Heavy rain, however, forced them down at Pelican Narrows and a week passed before the weather cleared. On the 9th they got through to Stanley Mission where further difficulties caused another delay. By this time the crew of the "Viking" were becoming anxious to reach Prince Albert as soon as possible as their estimated date of arrival had passed. On the morning of 11 August the aircraft made one flight from Stanley Mission to Ile-à-la-Crosse, covering 220 miles in 3.15 hours, and then in the afternoon made a second flight of 250 miles in 3.55 hours to complete the photographic operation to Prince Albert. Here the rolls of film were packed and shipped to Ottawa to be printed. From Prince Albert the "Viking" then flew down the Saskatchewan to The Pas on the afternoon of the 12th, and two days later returned to Victoria Beach. In the four weeks that they had been away the four men had covered a distance of 2810 miles, flown 44.10 hours and taken about 1700 photographs. Their flight was hailed as "certainly the greatest ever undertaken for aerial survey; and, when considered in the light of practical results, (it is) one of the most brilliant achievements in the history of flying."(7)

Another oblique photographic operation was carried out in areas along the Ontario-Manitoba border, for which a refuelling base was established at Minaki, Ont. Work began in the latter part of June and, despite high wind and much cloud, some 2300 square miles in the Cross Lake area were photographed in 15 hours flying time by the beginning of July. Later in the season, in September and October, work was resumed in this area and 37.40 hours were flown to photograph 5200 square miles in the Oiseau and Fort Alexander sections.

Another "Viking" was sent to The Pas in September to complete an operation in the Kississing area which had been started in 1923; in 41 flying hours the job was finished. Along

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(7) Report on Civil Aviation, 1924; pp. 73-4. S/L Hobbs' detailed account of the expedition is published as Appendix D to this report (pp. 92-103).

the eastern shore of Lake Winnipeg yet another photographic operation was carried out late in the season, in conjunction with forest patrols, to take obliques of the area from Fort Alexander north to Berens River. Using a refuelling base at Matheson Island, the crew completed the assignment in 35 hours, including 8.25 hours flown on one day of particularly good weather. A few flights, involving about 8 hours, were made to photograph hydro-electric developments and potential sites for the benefit of the Water Power and Reclamation Service.

In addition to all the forestry patrols and photographic operations the two Manitoba bases flew 14.20 hours on transportation for the Department of Indian Affairs. This included a treaty money flight which had to be curtailed, and a mercy flight that was most timely. The treaty money flight began at Norway House on 29 July when an aircraft set out carrying an Indian agent and a doctor in addition to the pilot and mechanic. Landing at Cross Lake, the agent paid out treaty money while the two airmen assisted the doctor in vaccinating the Indians. Their work completed at this point, the party returned to Norway House, and set out again on the 31st, intending to visit Oxford House, God's Lake and Island Lake, at which points gasoline caches had been laid down. The treaty payments were made as planned at Oxford House, but engine trouble developed shortly after the aircraft took off for the next point of call. In the forced-landing the flying-boat received such severe damage that the remainder of the journey had to be completed by canoe, and further flights that had been planned were cancelled.

When freeze-up became imminent operations were suspended at Norway House and on 10 October the aircraft flew south to winter quarters. Ten days later diptheria broke out in the district; medical aid was urgently required. The steamer which operated from Selkirk to Norway House during the summer had stopped running. A special boat trip at that season of the year would have involved great danger owing to the prevalence of gales and heavy seas on the lake, and would also have involved the risk of being caught by the freeze-up before the journey was completed. In the crisis the Department of Indian Affairs turned to the air force for help. At 1100 hours on 20 October Victoria Beach received a telegram from Air Headquarters, explaining the situation and asking if a flight could be made. Twenty minutes later an aircraft was on its way south to Selkirk to pick up the anti-toxin, and another aircraft was standing by ready to fly the medicine from Victoria Beach to Norway House. Within six hours of receipt of the telegram the medical supplies had been delivered at their destination 320 miles away. The next day the aircraft returned to base. In less than nine hours flying time it had completed a mission that, by other means, might have required several days or weeks.

On that happy note of "something accomplished, something done" operations in Manitoba ended for the year. A few days later the aircraft were flown from Victoria Beach to Winnipeg where they landed on the Red River and were drawn ashore to be dismantled for overhaul during the winter.

Ottawa

RCAF Station Ottawa consisted of an operational base at Rockcliffe, used during the summer and autumn, and a headquarters on Victoria Island, farther up the Ottawa river, where there were a slipway, workshop and stores buildings. F/L C. McEwen was in command with a staff of three officers and 20 airmen.(8) Only two aircraft were in use, a "Viking" and an HS2L, and little civil work was done, most of the flying (180 hours) being for experiment, training and service duties.

Four photographic operations, totalling 26.25 hours, were undertaken for different branches of the Department of the Interior. The principal task was a mosaic of certain islands in Georgian Bay requested by the National Parks Branch. The "Viking" was flown to Parry Sound in August, and although bad weather caused much delay - and inadequate maps were a further handicap - the work was finally completed. Another operation for the Forestry Branch was an experiment to determine the utility of aerial photographs for "timber cruising"; photographs were taken of the same forest areas using different altitudes and focal lengths to test their suitability for type interpretation. The HS2L was used to take oblique photographs near Kingston, Ont. for the Ordnance, Admiralty and Railway Lands Branch; and more obliques were taken of power sites along the Ottawa River for the Water Powers and Reclamation Service.

Dartmouth

S/L J.H. Tudhope replaced S/L Shearer in command of RCAF Station Dartmouth late in 1923. The staff was very small, numbering only six to twelve airmen; while photographic operations were in progress an officer specialist in that field was attached to the station from Camp Borden. The success of the photographic work undertaken in 1923 led to an expansion of that activity in 1924 and 61 hours, more than half of the station's total flying time, were spent on aerial survey photography. Only one aircraft, an HS2L, was in service. To give it a better performance, the old low-compression Liberty engine was replaced by a high-compression type which had enough extra horsepower to enable the flying-boat to reach the ceiling of 10,000 feet needed for photographic work.

Two photographic operations were completed for the Topographical Surveys Branch to serve as the base for new up-to-date maps that were being produced. In one operation oblique photographs were taken of the whole area covered by Digby, Shelbourne and Yarmouth counties; in the other, 65 square miles in the New Glasgow and Pictou areas were covered by vertical photographs.

A small photographic assignment was carried out for the Department of National Defence and other miscellaneous chores included flying demonstrations at Lunenburg and Halifax, and a search for the body of a missing man. At the close of the season in October the station was placed under a care and maintenance party, the remainder of the staff being transferred to other units for the winter.

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(8) P/O J.H. Hector was the equipment officer.

Round-the-world flights

In 1924 the aviation world was buzzing with plans for flights around the world; three expeditions actually set out and one reached its goal. The project for such a flight had first been put forward in 1919 and was revived every year thereafter until success was finally achieved. Canada lay on the routes proposed by all the contenders and, although neither the Air Board nor its successor the RCAF were directly involved in the plans, they were called upon to offer advice and assistance.(9) In 1920 when Capt. A. Marchal, a noted French aviator, proposed to enter an "aerial derby around the world" the Air Board sent him a set of maps and some general information about routes across Canada, pending a more detailed survey which the Board was undertaking. A year later, when Sir Ross Smith, pilot on the first England-to-Australia flight, was planning a flight around the world the Air Board was able to provide a detailed suggested route across Canada from Kodiak Island to St. John's, Nfld., divided into legs of 280 to 700 miles each; it promised him "every assistance possible" for engine changes and other requirements. The death of Sir Ross in a flying accident early in 1922 ended the project.

The next to enter the field was Major W.T. Blake who was given information about landing grounds on the west and east coasts of Canada. His flight actually got under way in May 1922 and reached India before it had to be abandoned. Offers of assistance, including the use of Air Force facilities across Canada, were also made to Mr. R.H. McIntosh and Capt. Norman Macmillan who were planning flights in 1922 and 1923.

The first contender to take off in the 1924 race around the world was Major A.C.S. MacLaren who left England on 25 March. A month earlier his agent, Lt. Col. L.E. Broome, visited Ottawa and "with the greatest gratification and confidence" placed the organization and details of the trans-Canada route from the Pacific to the Atlantic entirely in the hands of the RCAF. The commanding officers at High River and Winnipeg were then asked to investigate some proposed landing places in their areas, full details about routes were sent to MacLaren, arrangements were made for landing facilities and fuel supplies, and W/C Stedman wrote to the pilot telling him of some of the difficulties which had been encountered in the use of Vickers "Viking" aircraft in Canada. The RCN also helped in the project, placing HMCS "Thiepval" at the disposal of the expedition to dump supplies at sites in northern Japan, the Kuriles and the Aleutians. MacLaren's very gallant effort got as far as Japan where it ended in a forced-landing at sea. The aircraft was salvaged by the "Thiepval", whose timely assistance was in no small measure responsible for the safe return of the party. Visiting Ottawa on his way home, MacLaren discussed his flight with RCAF officers, and both Air Chief Marshal Trenchard, the RAF Chief of the Air Staff, and the Air Council expressed their thanks to the Canadian Naval and Air Services for their "invaluable assistance."

Twelve days after MacLaren started his eastward flight four aircraft of the United States Army Air Service left Seattle on a westward route (6 April 1924). With this expedition, which touched only the two coasts of Canada, the RCAF was less directly

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(9) On this subject see AFHQ file 1008-1-6, vols. 1-4.

concerned.(10) In the planning stage it assisted in preliminary investigation of the Seattle-Attu section of the flight, and S/L Godfrey and F/O MacLeod provided information, based on personal knowledge, about the route from Vancouver to Prince Rupert. Later, American officers visited S/L Tudhope at Dartmouth to obtain information about conditions on the east coast.

Late in August, when the American fliers were homeward bound, G/C Scott went down to Pictou, N.S., to welcome them on their arrival on Canadian soil. S/L Tudhope flew over from Dartmouth with an HS2L to join his chief, and when the round-the-world aircraft reached Pictou on 3 September the RCAF flying-boat escorted them in to the landing area. After the American fliers were safely home Gen. Mason M. Patrick, Chief of Air Service, wrote to Scott to express "deep appreciation for the splendid assistance given to the advance officers and the members of the Expedition. Your willing help has contributed very largely to the success of this undertaking."

The American triumph overshadowed another very sporting effect by an Argentine aviator, Major P. Zanni. Like other contestants, he was promised all aid possible in storing fuel, spare parts and so on at Prince Rupert, Vancouver and Halifax. Accompanied by a mechanic, Zanni left Amsterdam on 26 July 1924, flying a Fokker C. IV. He reached Calcutta, 5752 miles away, in fourteen days - a remarkable achievement for those days that was little noted at the time because of the interest in the larger American expedition. Winter interrupted Zanni's flight in the Far East and although he planned to resume the flight across the Pacific in the spring of 1925 he was unable to do so. Three cases containing a Fokker aircraft, propellers, spare parts and tools, which had been shipped to Vancouver to await his arrival, remained unclaimed and eventually were put up for sale.(11)

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(10) See AFHQ file 1008-1-17.
(11) See AFHQ file 1008-1-18.

Chapter IX

A. Parliament 1925

As in the previous year, air matters aroused little discussion in the House of Commons. During the debate on the budget one member (1) urged an improvement in Canada's naval defences and read a resolution passed by the Air Force Club of British Columbia, of which Major A.D. Bell-Irving was president, asking that the Department of National Defence consider the formation of a Reserve Air Arm, to be trained under R.C.A.F. supervision, to guard "the coast of British Columbia which lies nearest the most probable Zone of warfare in which in the future Canada might be defensively engaged." (2) Another member quoted the words he had heard an officer use: "O Canada! we stand on guard for thee - at a lower capital cost than that of any other country in the world except Bolivia." (3) But these voices were the exception; the emphasis was still on disarmament and reduction of expenditures. Speaking in the budget debate, the prime minister (Mr. King) referred to the overall reduction in the estimates from the previous year and pointed out that, although there was an apparent increase in the defence estimates, the combined military and naval services actually showed a decrease. The apparent increase was $243,220, but all of this sum, and $75,000 more, was accounted for by the increase of $319,850 in the amount allocated to the air service for the purchase of new aircraft. These aircraft were required primarily for forest patrol "in the interests of the various provinces" and the increase in the air estimate resulted "from the taking over by the Defence department of patrol services formerly under other departments of administration." (4)

Mr. Macdonald, the defence minister, repeated the point when his estimates came up for discussion. In the total defence vote only the air service received an increase; the major vote of $1,140,000 for maintenance of air stations, operations, training, control of civil aviation, and research was $121,000 lower than the previous year; the second vote of $740,850 for the purchase of aircraft, technical equipment, and the provision of ground services was $440,850 more than in 1924-25. This increase was necessary to procure more machines for fire patrol and to carry out work for the Department of the Interior in western Canada. The minister added that his department did not levy any charges against the departments for which it operated. From the new equipment vote it was proposed to buy ten aircraft built in Canada and to recondition twelve "admiralty planes" (sic; presumably flying-boats). Both items were agreed to with little discussion.

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(1) The Hon. S. F. Tolmie of Victoria City, B. C.
(2) Hansard, 1925 Session; Vol. III, p. 2549 (28 April 1925). The minister later told the House that the resolution had been referred to the officers of his department (ibid.; Vol. IV,p. 3292).
(3) Ibid.; Vol. IV, p. 3290.
(4) Ibid.; Vol III, p. 2652. The prime minister did not make the best of his case. The estimate for air service maintenance and operations, etc., had actually been cut by $121,000; the only increase was in the new equipment item which rose by $440,850, making a net increase of $319,850.
(5) Ibid.: Vol. V, pp. 4864, 4873 - 4 (24 June 1925). The minister said that the cost of aircraft varied from $12,000 to $20,000 according to type, and the average life was five to six years.

B. Royal Canadian Air Force 1925.

Limited funds continued to restrict the defence forces and moved the department to point out that: "It is necessary that much increased votes for both the Militia and Air Services should be made available before these services can be brought to such a state of efficiency as will permit of the mobilization of a well trained and fully equipped force of adequate strength for our needs." The R.C.A.F. was "still very much handicapped by lack of suitable equipment owing to the paucity of funds. Old material has had to be used as well as unsuitable equipment. A great deal of the equipment still in use is part of that presented by the British Government to Canada in 1919.....Special attention is directed to the very hazardous flying which is carried out in many parts of Canada, particularly in Alberta and Manitoba, by the pilots of the Royal Canadian Air Force. It is imperative that no false ideas of economy should be allowed to interfere with the provision of the very best material available in the world for the use of the personnel of the Royal Canadian Air Force in these operations, undertaken to protect the forests of Canada and for the execution of aerial survey." (1)

The first new aircraft acquired by the R.C.A.F. to replace the obsolete war-time types was the Vickers "Viking" which made its appearance in 1923. This was followed by the Vickers "Vedette", the first product of Canadian Vickers' own design staff, which in 1925 completed a season's work in the field at Ottawa and "proved to be a complete success and a credit to her designer and builder." For forestry work, photography and light transportation, the "Vedette" was "a remarkably efficient little working boat....the equal, and for Canadian conditions the superior of any flying boat in the world today." (2)

A small biplane of single-bay construction, the "Vedette" carried a crew of three, the pilot on the left side of the cockpit, the air engineer or passenger on the right side, and the observer or photographer in a large cockpit in the nose. The control column was wheel type. Fuel was carried in a main tank in the hull behind the pilot's cockpit; a gravity fuel tank and the oil tank were fitted under the top wing in front of the engine, forming a fairing for the engine. Fuel was pumped from the main tank to the gravity feed by a pump driven by a flexible shaft from the engine; a hand pump was also provided for emergencies.

The wings were of wood and fabric construction. The centre section was somewhat unusual in that the rear truss which carried the engine was in the shape of an X with external bracing wires. The tailplane had adjustable incidence operated by the pilot through a lever and quadrant. This provided a quick positive fore and aft trim and allowed the pilot to feel for the correct setting to suit immediate flight requirements.

The hull was of semi-flexible monocoque construction, the ribs being hoop-shaped and fixed rigidly to the keel. Cedar planking with copper riveting was used throughout, the top planking being 3/16 of an inch thick, the bottom fore body ¼, and the bottom aft body 3/16; the whole hull was covered with two layers of canvas.

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(1) D.N.D. Report 1925-26, pp. 5-6.
(2) Report on Civil Aviation, 1925; p. 14 and p. 81.

This construction proved very satisfactory; on more than 100 hours of flying in 1925, during which the "Vedette" remained in the water for weeks at a time, the hull remained absolutely dry and free from soakage.

The first production models of the "Vedette" had a 200 h.p. Wright "Whirlwind" radial engine mounted pusher fashion.(3) With full load it climbed to 10,000 feet in about 30 minutes and reached its service ceiling of 13,000 feet in 45 minutes. At ground level the speed at full throttle was 95 m.p.h., and at 10,000 feet 75 m.p.h.; cruising speed at 5,000 feet was 75 m.p.h. with fuel consumption of 12 gallons per hour giving the aircraft an endurance of five hours. The outstanding features of the "Vedette" were its quick take-off and good manoeuvrability under all conditions. With full load the flying-boat could take off in about six seconds from calm water. Its landing speed was a low 45 m.p.h. Taxying could be carried out with ease, up, down or across a fresh breeze, without calling on one of the crew to do any "wing-walking" to maintain lateral balance.

The dimensions of this remarkable little craft were: mainplane span - 42 feet, chord - 6 feet 9 inches, gap - 78 inches; tailplane span - 12 feet 8 inches, chord - 32½ inches; elevator span - 12 feet 8 inches, chord - 1 feet 9 inches. The airframe weighed 1220.75 pounds, the power plant 628.2 pounds, fuel and oil 535, crew 540 and equipment 125, making a total all-up load of about 3,050 pounds.(4)

Late in 1925 the prototype of the second Canadian Vickers design, the "Varuna", was delivered to Ottawa for trial flights. A larger, twin-engined flying-boat, the "Varuna" was intended for fire suppression and freight carrying, being specially designed for quick take-off from small lakes and for transportation of fire fighters and equipment. It was also fitted for vertical and oblique photography although it was not proposed to use it on this work except when the operation was at a great distance from base and supplies had to be carried for an extended expedition. For transportation to remote points or long range exploration and photographic flights an extra fuel tank could be installed to extend the radius of operation.

To give the "Varuna" the short take-off run essential for fire-fighting work, it was designed with wings of thick section (U.S.A. 27) having a high maximum lift coefficient and satisfactory efficiency over the flying range. This necessitated a rather large tail, but the additional weight was more than offset by the low landing and take-off speed, and the cleanness of the structure made possible by the use of deep spars. The upper plane was built in three sections and the lower plane in four, the outer sections of both planes being interchangeable. The landing edges were covered with three-ply. The outer sections were of orthodox wood and fabric construction with one-piece I-section spars; the centre sections were built of wooden ribs on steel tube spars. The empennage was all metal with fabric covering.

Four cockpits were provided in the hull, a large commodious one in the nose for the photographer, a pilot's cockpit just in front of the lower form spars, a freight cockpit between the lower spars, and an engineer's cockpit level with the trailing edge.

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(3) The prototype had a water-cooled V-engine.
(4) Report on Civil Aviation, 1925; pp. 98-9.

Three bulkheads were installed, one in front of the pilots' cockpit, one behind it, and the third behind the freight cockpit. The front bulkhead had an intercommunication door allowing access from the starboard seat to the front cockpit; the two rear bulkheads were made of celeron panels which could be easily removed. With the exception of these bulkheads there were no obstructions in the hull, thus facilitating the easy storage of equipment and the inspection of internal points. Small lockers were provided in the two rear cockpits for the neat stowage of equipment. In the prototype "Varuna" dual controls of the wheel and column type were installed, the starboard one being collapsible. The tailplane was adjustable by a lever in the centre of the pilots' cockpit. All moving parts in the aircraft were fitted with nipples for lubrication.

The hull was semi-flexible, built of cedar planking laid on fore and aft spruce stringers supported by rock elm ribs. Planking on top of the hull was covered with canvas; the bottom of the hull was built with a layer of cedar planking laid at an angle of 45°, a covering of fabric, and an outer skin of cedar laid fore and aft.

The engines, two tractor 200h.p. Wright "Whirlwinds," were on V-mountings, with oil tanks at the rear. Initially hand starters were used, but it was expected that inertia starters would be introduced. To provide for contingencies a rather elaborate fuel system was installed. Normally, each engine was fed by a 45-gallon tank mounted in the wing. For long flights, however, or for transportation of gasoline, a 60-gallon tank could be mounted quickly in the freight cockpit and connected to a hand pump which led to the wing tanks. In addition a connection was provided on the starboard side of the hull which, by means of three-way cocks, could be used as an outlet for draining the wing tanks and freight tank, or for refuelling them by pumping gasoline from barrels in a tender alongside. As metal airscrews were not available, the preliminary trials were carried out with wooden propellers which showed that the performance "will be entirely satisfactory." With a full load the "Varuna" could take off in 220 yards, reach a top speed of about 90-95 m.p.h. and a ceiling of about 14,000 feet.

Dimensions of the medium-size flying boat were: span-55 feet 2½ inches top plane, 47 feet 4 3/8 inches bottom plane, chord - 7 feet, 2½ inches, gap - 8 feet; tailplane span - 21 feet 9 inches, chord - 7 feet 7 inches. The airframe weighed 2129 pounds, power plant and fuel tanks 1240 pounds, gasoline (90 gallons) and oil (8 gallons) 730 pounds, and crew of five and equipment 1200 pounds, making a total all-up weight of 5300 pounds. (5)

To meet the need for a small fire detection aircraft, ten Avro single-float seaplanes were built in 1925, and plans were being considered for a small single-seat flying-boat. A special photographic aircraft designed for year-round use on wheels, floats or skis was also under consideration. The limited funds available made it necessary to exercise the greatest economy in capital and operating costs. On forest protection work the

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(5) Report on Civil Aviation, 1925; pp. 100-102.

greater part of the time was spent on routine detection patrols; only occasionally were large aircraft needed to carry fire fighters and their equipment. The use of the HS2L or its successor the "Viking" for daily patrols was uneconomical, while a small single-seater fitted with wireless would be just as efficient and much less expensive.

By the close of the 1925-26 fiscal year the R.C.A.F. had grown to a strength of 75 officers and 343 airmen, an increase of 14 officers and 81 airmen since its official birth two years previously. (6) The personnel were distributed between five centres - 141 in the training school at Camp Borden, 125 at headquarters, air station and depot in Ottawa, 92 at Winnipeg and its sub-bases, 32 at High River, and 27 at Vancouver. Dartmouth, which had been reduced to a care and maintenance basis during the winter months, had only a caretaker in charge. When the air force took over the Air Board's civil bases, it continued to use the designation "station" until July 1925: then, to give its organization a more military appearance, the R.C.A.F. revived the service designations "wing" and "squadron". R.C.A.F. Station Vancouver became No. 1 (Operations) Squadron, High River became No. 2, Ottawa (Shirley's Bay) No. 3, and Dartmouth (open only during the spring and summer) No. 4 Squadron. The air force establishment in Manitoba became No. 1 Wing, which included No. 5 (Operations) Squadron and its three flights at Victoria Beach ("A), Norway House ("B") and Cormorant Lake ("C"). R.C.A.F. Station Camp Borden became No. 1 Flying Training Station, and the Technical Depot at Victoria Island, Ottawa became No. 1 Depot. The title of the Photographic Section was unchanged. (7)

The situation at Camp Borden was still unsatisfactory, and the question of moving the training centre to a more suitable location was raised several times in the House of Commons by interested members during the 1925 session. (8) The minister could say only that the matter was under consideration and no decision had been reached. The buildings at Camp Borden were deteriorating, some had been destroyed by fire, and furthermore the increasing use of hydroplanes made it perhaps advisable to move to some site closer to water; Deseronto had been examined, but no action had as yet been taken. Subsequently an "excellent site" was surveyed at Deseronto for a joint land-and seaplane training base to replace Camp Borden. Hopes of moving there, however, had to be deferred pending provision of funds for the construction of buildings, and meanwhile Camp Borden carried on.

The courses given at the Flying Training Station in 1925 included a six-weeks armament and gunnery course for nine officers and refresher training for four officers and three commercial pilots in addition to the P/P/O course. The latter scheme, now in its third year, had 55 pupils under training. The first term intake numbered 29, of whom 22 were from university C.O.T.C.s, and seven from R.M.C.: 20 of the group passed the examinations

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(6) Authorized establishment for the P.A.A.F. was 95 officers and 375 airmen, and for the N.P.A.A.F. 67 officers and 130 airmen.

(7) G.O. 69/25. The effective date was retroactive to 1 April 1925, but the new titles did not actually come into use until July.

(8) By Mr. W.A. Boys (South Simcoe) on 22 April 1925, Mr. T. L. Church (Toronto, North) on 23 April, and Mr. A.E. Ross (Kingston) on 24 June; Hansard, 1925 Session; Vol. III, p. 2321; Vol III, p. 2347; and Vol. V, pp. 4873-4.

at the end of the first term and 16 eventually qualified for their pilot's wings. (9) In the second term there were 16 P/P/Os, eight from R.M.C. and eight from C.O.T.C.s, 14 completed the term and two, B.F. Johnson and W.D. Van Vliet, remained at the station to continue with their third term, receiving the flying badge in December of that year. As the original intake of 1923 had ceased when four of the pupils completed training in December 1924, a new "third term" was constituted in 1925, with ten pupils including six R.M.C. graduates who were appointed to permanent commissions in the R.C.A.F.; for this group the three terms were given as one extended course. P/O T.G.C. Mathews was killed in a flying accident on an Avro 504 at Camp Borden on 22 October 1925. Six members of the group completed the course, P/Os R.M. Carr-Harris, W.J.G. Holland and E.C. Luke receiving their wings in December 1925, followed by P/O E.E. Middleton in March and P/Os W.W. Brown and D.H. MacCaul in April 1926. (10)

An important innovation in 1925 was the introduction of parachutes into the R.C.A.F. Late in 1924 F/O Albert Carter, MM and Cpl. A. Anderson were detailed to take a parachute riggers course at the U.S. Army Air Service Technical School at Rantoul, Ill. On their return to Canada they conducted training courses at Vancouver, High River and Camp Borden at which seven officers and nine airmen qualified as parachute riggers. In April 1925 the wearing of parachutes during flights in service aircraft was made obligatory. (11) Parachute trainees were not required to make practice jumps, but were permitted to do so if they wished: during the year 35 practice jumps were made. In the course at Vancouver F/O Carter gave a demonstration "pull-off" from the wing of an HS2L at 600 feet and then made a second jump from the cockpit.

While Camp Borden gave training on landplanes, Vancouver conducted seaplane courses on HS2Ls, introducing an ab initio course in March 1925 for a number of pilots, several of whom had just won their wings at the Ontario base. At the termination of the course in May most of the officers were posted to Winnipeg to begin operational flying on forest patrol.

Ground training was concentrated largely in the winter months when flying operations were suspended at most of the stations. In addition to the inevitable physical training and drill, courses for officers and airmen were given in such subjects as air force law and discipline, aeronautical engineering, airmanship, and "interior economy". More officers were now being sent on "courses abroad" for training in R.A.F. schools. At the R.A.F. Staff College, Canadian representation in 1925 was increased to two with both W/C Barker and S/L Godfrey in attendance for the fourth course; and F/L A.A. Leitch took the armament course at Eastchurch. When Barker went to Staff College in the spring of 1925 S/L G.M. Croil

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(9) The graduates were B.C. Blasdale, W.E. Butler, M. Costello, J.T. Dyment, T.L. Hall, W.F. Hilchie, O.E. Keene, H.M. Kennedy, W.R. McIntosh, S.R. McMillan, L.A. Matheson, R.R. Peterson, F.A. Sampson, C.L. Trecarten, and R.M. Wynd, who qualified on 31 August 1927, and R.C. Gordon who completed his third term in 1928.

(10) Two other members of this group, P/Os J.P. Donnelly and R.A. London, became stores officers in the Non-Flying List. (DND Report says 7 graduates.)

(11) Weekly Orders in March 1925 approved four types of parachutes for use and laid down an establishment of 107 parachutes for the service. Instructions were also issued for their care and maintenance.

took over the duties of R.C.A.F. Liaison Officer at the Air Ministry.

The usual combined operations were carried out with the Army and the Navy. These included a three-day militia staff course at Lennoxville, P.Q., in July, and artillery cooperation courses at Sarcee in August, Petawawa in September, Dartmouth and Esquimalt in October. The total flying on the five courses was 93 hours.

In addition to photographic work for other departments of the government the R.C.A.F. did some "service" photography for the Geographical Section, General Staff (formerly known as the Survey Division) of the Army to assist it in the preparation and revision of detailed maps. In the summer of 1925 an area of 600 square miles in the Rideau Lakes around Westport and Perth was covered by 1741 "very excellent" vertical photographs which provided "an accuracy and minuteness of detail that could not be obtained by ordinary ground methods, except at a prohibitive cost." The Rideau Lakes area was "probably the most difficult, from a survey point of view, that has been undertaken by the Geographical Section" and the introduction of air survey methods added "a new interest" to its work, while the inter-service co-operation was of mutual benefit in training in photography and mapping for military and other purposes. (12)

The total flying by the R.C.A.F. in 1925 was 5111.47 hours, of which 2518.36 (or just under one-half) were on civil operations and the balance (2593.11) on service flying. The total hours had increased by almost 1200, or 30%, over the previous year, the major increase being in service flying which rose by 60%.

Most of the construction work in 1925, which cost a total of $204,194, was in the Ottawa area where a new operational base was opened and the repair and stores depot was enlarged. Since 1920 Ottawa air station had been located at Rockcliffe adjacent to the rifle range. Although suitable for landplanes the site was not satisfactory for seaplanes as the high banks of the river hindered the erection of slipways and other accommodation needed for flying-boats. In 1924 the Army closed the Rockcliffe range and moved to the new Connaught range on the shore of the Lake Deschenes expansion of the Ottawa River near South March. At the opening of the 1925 season the Air Force followed suit and moved the air station, soon to be redesignated No. 3 (Operations) Squadron, to Shirley's Bay alongside the rifle range. The foreshore was cleared, hangars, stores, offices and other buildings were erected, and light, water and telephone services were installed. Landplanes could not be operated from Shirley's Bay, but the low banks of the river and the wide expanse of water facilitated the use of seaplanes and flying-boats. When winter set in the aircraft, engines and equipment were moved to the depot on Victoria Island for repair and overhaul. Some of the squadron personnel were engaged on this work through the winter, while the remainder did routine duties at a temporary squadron office and stores located in the Labelle Building in Ottawa.

No. 1 Depot on Victoria Island was improved and enlarged during the year. As the central repair and stores depot for the whole service, the depot issued stores and equipment to all Air Force units, repaired equipment which could not be handled by the units, and did inspection duties on aircraft being manufactured for the R.C.A.F. Hitherto these activities had been centred in an old, large greystone building. Now modern fireproof

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(12) D.N.D. Annual Report 1925-26; p. 8.

workshops were erected for the repair section, and the stone building was remodelled for the stores section; a central oil-heating plant was also constructed.

Barrack accommodation was lacking for personnel stationed in Ottawa, and the same situation existed at Vancouver, High River and Winnipeg; only Camp Borden was well provided in this respect. At Winnipeg the headquarters of the air station (No. 1 Wing) was moved from Fort Osborne Barracks, where it had been located since 1922, to new accommodation at 797 Notre Dame Street. Plans to provide flying facilities at Winnipeg were advanced by the acquisition of more land to add to the tract adjacent to the Barracks which had been purchased in 1922 for use as an aerodrome, but funds were not yet available for the erection of hangars and workshops. The operational bases needed more ground equipment and housing facilities.

All units were calling for more modern aircraft. No. 1 Squadron at Vancouver had only obsolete HS2Ls; No. 2 at High River wanted new types "specially designed for the dangerous conditions met with in the foothill region"; and No. 1 Wing in Manitoba needed more efficient aircraft to replace the Avro "Viper" on forest patrol and a larger flying-boat for fire suppression work.

The R.C.A.F. radio system in western Canada, with stations at Jericho Beach, Prince Rupert, High River, Winnipeg, Victoria Beach, Norway House and Cormorant Lake, was operated by four officers and 32 men from the Royal Canadian Corps of Signals. (13) The four stations in the Manitoba system were kept open during the winter of 1925-26, making it possible to provide communication in the early spring when ice conditions stopped mail service, and enabling the R.C.A.F. to move men and equipment to the summer bases at a much earlier date than in previous years.

Dress Regulations

When the C.A.F. received the distinction "Royal" it was decided to adopt the uniform and insignia of the R.A.F. The new dress regulations for officers were formally approved on 29 July 1925 (14) and the grey-blue R.A.F. uniform began to replace the dark blue uniform of the C.A.F. Wearing of the old pattern uniform was permitted for three months and, as a working dress only, until 1 April 1926. Although in general the dress prescribed by the regulations of 1925 corresponded to that worn by the service 30 years later, there were many differences in detail. Six orders of dress were laid down - full dress (home), full dress (tropical), mess dress (home), mess dress (tropical), service dress (winter), and service dress (summer). Swords and scabbards, described in detail in the regulations, were carried with full dress. With winter service dress breeches, puttees and boots were worn, but trousers with permanent turn-ups, or cuffs, could be worn as

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(13) The R.C.C.S. personnel were paid from R.C.A.F. funds.

(14) P.C. 1237. A Dress and Clothing Committee had been set up in 1924 to review, recommend for adoption and seal samples of items of wear required for the R.C.A.F. As far as possible consistent with climatic conditions, the new pattern clothing was to be that used by the R.A.F.

working dress within the unit. The same provision applied to the khaki summer dress, with the additional proviso that shorts could be won in lieu of breeches. Fur caps, detachable fur collars, and fur gauntlet gloves were authorized for winter wear. White shirts were worn with winter service dress by all officers except P/P/Os who wore grey flannel. A khaki Wolseley helmet or blue service cap could be worn with summer dress. Service caps were the same for all officers, no provision being made originally for the gold leaves, or "scrambled eggs", carried on the peak in later years by group captains and above. When on parade or walking out in uniform officers carried canes. The authorized badge for observers had the R.C.A.F. monogram embroidered in the centre of the "O". Another feature of the 1925 regulations which disappeared a few years later was the provision of distinguishing term badges for provisional pilot officers; above the normal pilot officer's rank braid they wore a two-inch strip of narrow silver braid, one strip for first year trainees, two for second year, and three for third. Air Force colours - dark blue, dark red and light blue - were approved for tie, sash, hatband and blazer; officers who had represented the R.C.A.F. in championship sports or games were permitted to wear a distinctive badge on their striped blazers.

Operation "Eclipse"

An interesting operation undertaken from Camp Borden in 1925 was an attempt to photograph from the air a total eclipse of the sun on 24 January. The project was initiated by the Toronto "Star" newspaper which, unable to obtain civilian aircraft at that time of the year, approached the Department of National Defence and was given full co-operation. G/C Scott, Director of the R.C.A.F., enthusiastically backed the project and instructed W/C Breadner, the C.O. at Camp Borden, to make the necessary arrangements. Two Avros were detailed, one to be flown by F/L G.E. Brookes with F/O A.L. Morfee as photographer, and the other by F/L R.S. Grandy with Mr. Fred G. Griffin, "The Star" reporter, as observer.

At 0800 on the morning of 24 January the two aircraft took off from Camp Borden into an overcast sky and headed south, bucking a strong head-wind. Grandy's Clerget-engined Avro dropped behind the faster Lynx-engined Avro carrying Brookes and Morfee. Over Holland Landing, a few miles north of Newmarket, a connecting rod in the Clerget broke, forcing Grandy to land in a small farm field. By the time a relief plane arrived from Borden to fly Griffin to Toronto the eclipse had passed.

Brookes and Morfee were more fortunate. Over Richmond Hill they began to climb to get above the solid blanket of cloud that covered the sky, but, delayed by the head wind, they were still in the overcast when the totality phase of the eclipse came at 0907. The light began to grow dim and in about 45 seconds everything was in darkness; Brookes could just faintly make out the outline of the compass 18 inches in front of his face. The deep twilight lasted for a minute before daylight returned. At 9400 feet the Avro broke through one layer of clouds and through a rift in a higher cloudbank Brookes and Morfee were able to see a thin streak of the sun, a slender crescent that glowed clearly and distinctly as it began to emerge from behind the moon. Although cloud patches hampered his work Morfee was able to get several photographs of the phenomenon. Then Brookes landed his ski-aircraft on the ice of Toronto Bay to rush the negatives to the offices of "The Star" in time to make the afternoon editions of the newspaper along with the stories of the participants in this unique operation.

Personnel

Eleven officers were appointed to the Permanent Active Air Force during 1925. These included S/L Shearer, F/L A.L. Johnson, and P/Os C.M. Anderson, EJ. Durnin, GR. Slemon and WC. Weaver who were transferred from the N.P.A.A.F., and F/L RS. Grandy who had originally been included in the initial group commssioned on 1 April 1924. The other four officers, P/Os W.W. Brown, J.P. Donnelly, RA. London and DH. MacCaul, all graduates of R.M.C., were mentioned above.

Appointments to the Non-Permanent, other than P/P/Os taken on strength for training during the summer, included P/Os A. Lewis and WI Riddell, F/Os AR. Browne, CH. Cameron, HV. Butterfield, and LW Evans, and P/O GH Creusen. F/O Evans was the first accounting officer appointed in the RCAF. Browne, Cameron and Creusen served for only a year; the other four were later transferred to the PAAF.

C. Civil government air operations 1925

R.C.A.F. operations for other departments of the government continued to expand in 1925. The five stations engaged in this work flew 2440 hours during the year, (1) an increase of about one-tenth from the previous year. Forest patrol was still the major item in the civil programme with a total of 1348 hours; most of this work was in Manitoba (848 hours), with a considerable amount (489 hours) in Alberta, and a small amount in British Columbia. The forest patrols were slightly less than in 1924, due in part to wet weather which reduced the fire hazard. The volume of aerial survey flying was increased, from 508 hours in 1924 to 672 in 1925, and the area photographed was also increased by 20%. Nevertheless the total - 48,000 square miles, including 38,000 in Manitoba, 8,600 in Alberta, 1140 in Ontario, and 225 in Nova Scotia - fell far below the original programme of 70,000 square miles; unfavourable weather, low cloud, haze and smoke, greatly hampered these operations in both western and eastern Canada. (2) The fishery protection patrols from Prince Rupert in British Columbia were almost doubled this year, with 296 hours' flying on that service.

There was an expansion also of operations for the Department of Agriculture to assist its study of forest and grain blights. In earlier years some spore-trapping flights had been made on the Pacific coast for the investigation of the white pine blister rust. This work was continued in 1925 and extended eastward to gather data on wheat rust in the prairie provinces. Although aircraft could not be spared specifically for these experiments, spore slides were exposed during normal forest and photographic flights and much valuable information was obtained to show that wheat rust was airborne, the spores being carried in great numbers over long distances. The evidence gathered indicated that the disease was brought into Canada by the wind from infested areas south of the prairies.

Vancouver

S/L Godfrey who had been in command of Jericho Beach since October 1922 went overseas in March 1925 to attend R.A.F. Staff College. F/L MacLeod then took over temporary command until December when S/L Tudhope arrived from Dartmouth to become commanding officer. The staff - four pilots, an equipment officer, and 21 airmen - was about the same as in the previous year; the "Viking", however, had been withdrawn and four HS2L flying-boats were used on operations. These totalled about 560 hours, including 176½ hours of service flying for seaplane training and naval co-operation training.

The major civil task was still fishery protection patrol which required 296 hours of flying. A sub-base was opened at

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(1) In addition to civil operations the stations did about 904 hours on service flying, including training, co-operation exercises with the other services, parachute training, transportation, testing, practice flying, and demonstration.

(2) Early in 1925 a Central Aerial Surveying Unit was set up in the Topographical Surveys Branch of the Department of the Interior to study the practical application of aerial photography and to control all aerial photographic operations and the associated office work (P.C. 180 of 7 February 1925). See Report on Civil Aviation, 1927; p. 43.

Casey Cove, near Prince Rupert, on 18 June 1925, with a staff of two officers and six airmen from the R.C.A.F. and one officer and a signaller from the R.C.C.S. Three of the station's flying-boats were detached to the sub-base. In the three months that Casey Cove was in operation (18 June to 28 September) 122 patrols were flown over the Naas and Skeena rivers and the surrounding area with week-end patrols in the Swanson Bay district. When the fishing season opened in the Queen Charlotte Islands late in August an aircraft was despatched to make some flights from Queen Charlotte City. This year wireless communication was maintained throughout the season between the aircraft and base with satisfactory results.

In the early part of the season numerous offenders against government fishery regulations were apprehended, and 24 offenders were subsequently prosecuted as a result of the air patrols. (3) Illegal nets were confiscated on the spot by the aircraft crew and, if possible, taken on board the flying-boat for delivery to the fisheries inspector.

After operations ceased at Prince Rupert some patrols were flown in the southern area, an aircraft being detached for ten days in October to a temporary base at Bamfield on the west coast of Vancouver Island. These patrols added 42 hours to the 254 flown at Prince Rupert; visibility in the patrol area was exceptionally bad because of forest fires and fog.

Reporting on the results of this work, the Chairman of the International Fisheries Commission said that he had never seen "such an effective patrol of seine fishing as has been conducted by the Canadian Air Service on the Skeena and Naas rivers during the last two years. It is a masterly way of handling such a situation - the most effective yet devised." (4)

Some customs patrols were flown from Vancouver to escort liners in and out of the harbour (27 hours), and some transportation flights (14 hours) were made for the Soldier's Settlement Board to examine Graham Island; the Commissioner of the Board reported that the aerial reconnaissance was "of the greatest value" in eliminating areas unsuitable for settlement and permitting him to concentrate on areas which would repay further examination.

The station's facilities did not permit a regular forest patrol service; instead special flights were made when required for a total of about 16 hours. Some of the flights were to drop propaganda leaflets along the Fraser valley during a forest conservation campaign, and the others were for patrol and transportation of provincial forestry officers during the period of extreme fire hazard on the coast.

Limitations of staff and equipment also made it impossible to do as much flying as was desired in support of the investigation of the white pine blister rust which was being carried on by the Botany Division of the Department of Agriculture. Nevertheless, in connection with other operations, the station made flights over

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(3) The principal offences were using too long nets, nets with illegal mesh, fishing in restricted areas, or during the week-end closed seasons.

(4) Report on Civil Aviation, 1925; p.50. The northern patrol area from the Alaskan boundary south to Cape Caution included about 5000 miles of waterway.

special areas so that a representative of the department could examine the timber for infestation and trap rust spores on greased slides which were exposed in the air. The department was expanding its research in this field to include the "dote" pest in airplane spruce in the Queen Charlotte Islands, a matter that was of great concern to the British government. (5)

High River

The five single-seater Avro "Vipers" which had been delivered to High River late in 1924 were used throughout 1925 for forest patrol, and two of the old D.H.4Bs were in service for photographic work. The station was well provided with three permanent hangars, shops, storerooms, office accommodation, wireless station and other ground facilities; barrack accommodation, however, was lacking for the staff of ten officers and 26 airmen under the command of S/L Cuffe.

Forest fire patrol was still the major function of the station, 60% of its flying - 489 hours out of a total of more than 800 - being on this service. The regular routine of morning and afternoon patrols to and from the landing - grounds at Eckville and Pincher Creek was continued with the Avros, but the fire hazard that year was low due to snow and wet weather in the foothills. Although fourteen fires were spotted from the air, prompt action by the ground forces confined the loss to negligible areas. This was the fifth successive season in which fire damage in the Alberta forest reserves was almost nil. The moral effect of the regular air patrols was believed to be very great as the daily passage of the aircraft overhead was a constant reminder to residents, trappers and tourists of the necessity for precautions in the use of fires.

There was less photographic work this year, due in large measure to unfavourable conditions of haze and smoke blowing over the prairies from forest fires which raged all summer in British Columbia. The D.H.4 photographic aircraft - a modified war-time bomber - was far from ideal for the conditions it had to meet. It took 45 to 60 minutes to climb to "operational" height of 12,000 feet above ground level (14,300 feet above sea level); above that altitude the rate of climb was 50 to 100 feet a minute which was inadequate to counteract the bumps that often attained a vertical velocity of 100 to 500 feet a minute. Cruising speed with engine throttled was 80 to 90 m.p.h. at 12,000 feet; this was satisfactory under normal conditions, but sometimes winds of such velocity were encountered that no headway could be made. Exposure to weather also greatly affected the performance of the aircraft. Rain, hail, sleet, snow and frost caused marked deterioration in the fabric and wooden parts of the fuselage; heavy dews also contributed to rapid deterioration as they had the same effect as rainfall nearly every night. In cold, wet weather the rubber shock absorbers in the undercarriage caused much trouble. There was difficulty too with the altimeters, two of which were carried, one for the pilot and the other for the photographic officer; the instruments showed variations of 200 to 400 feet due to inherent errors and the effect of temperature.

Despite all these handicaps the results obtained in 1925 were of excellent quality and a tribute to the teamwork of pilot,

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(5) See A.F.H.Q. file 1008-17-2, vol. 1.

photographer and mechanic. To the latter hard-working and all-but forgotten member of the air service much credit was due for the fact that operations were not delayed by defects or failures in aircraft or engine. In the air the pilot-photographer team devised a division of duties which had marked success in preserving uniformity of scale and avoiding gaps in the photographs: the pilot devoted his whole attention to maintaining constant altitude and keeping the aircraft in a horizontal plane while the photographer was responsible for keeping the aircraft on the correct line of flight. In this way the pilot and photographer developed "remarkable" ability to hold an even, true course on successive lines of flight that were often 90 miles in length and over country where landmarks were few. (6)

An area of approximately 8,600 square miles was photographed in 160 hours' flying on four operations for the Topographical Surveys Branch of the Department of the Interior. The largest task (73 hours) was vertical photography of a 4,350 square mile area in the Edmonton district, using an 8-inch lens at 12,000 feet. Another operation, flown in very bumpy weather, covered part of the Saskatchewan River as far as Rocky Mountain House, and a third assignment, although it concerned only a small area in the Buffalo Park Reserve at Wainwright, required 5½ hours of flying because of the distance of the objective from the aircraft base. The fourth operation, to photograph 4,350 square miles in the Fort Assiniboine area, presented unusual difficulties in navigation as a large part of the area north of the Athabaska River had not previously been surveyed and the existing map was very inaccurate. One high hill which made a very good landmark for navigation was found to be six miles away from its mapped position. During this operation the aircrew tried an interesting innovation. "The ground showed considerable differences in elevation and an effort was made to hold the height of the aircraft constant above the ground, so that the scale of the pictures should remain constant even though the elevation of the ground changed. The experience gained in this trial shows that where changes of ground level are not abrupt, no difficulty need be anticipated in holding a fairly constant height above ground level, provided the atmospheric conditions are fair." (7) Despite the navigational problems this operation was completed in the very good time of 56 hours, averaging about 78 square miles of photography per hour.

In addition to taking hundreds of photographs, the station was itself photographed for a motion picture made by the Fox Film Corporation to depict operations at High River. Another new item in the year's work was spore-trapping for the Department of Agriculture to assist its investigation of the wheat rust disease. Aircraft engaged on photographic operations around Morinville, Vegreville and Wainwright made 17 flights in July and August to expose spore-trapping slides. Apart from civil operations the station also did some service flying, including artillery co-operation at Sarcee Camp and parachute training.

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(6) Report on Civil Aviation, 1925; p.60.
(7) Ibid, p. 56.

One of the pioneer surveyor-navigators on this aerial mapping work was Mr. John Carroll, who has recorded some of his reminiscences of the early days. He began work with the RCAF in 1925, flying with photographic crews operating in the Red Lake district, then an unexplored area east of Lake Winnipeg. The aircraft was an open cockpit Vickers "Viking", with a top speed of 80 m.p.h. and a ceiling of 5,000 feet, in which the surveyor sat beside the pilot while the photographer stood in another cockpit in the nose of the amphibian. The navigator's instruments were a stopwatch, a barometer - and a piece of string tied to the photographer's arm. Whenever the surveyor wanted a picture taken, he would give the string a tug and the photographer would click his camera. Navigating purely by sight with few instruments and no maps to guide them, the crews not infrequently left gaps in their photographic coverage, but they never became lost. The "Viking" was invariably overloaded, and the labouring Rolls Royce engine "always used to boil over." To get the aircraft up on its step for take-off the navigator and the mechanic used to crawl up to the photographer's cockpit in the nose.

Manitoba

R.C.A.F. operations in Manitoba continued to expand and the units comprising station Winnipeg flew more than 1485 hours in 1925, an increase of 300 hours over the previous year. Almost 45% of all flying from the "Civil" stations was done by the Manitoba bases. In addition to the headquarters in Winnipeg and the operational bases at Victoria Beach and Norway House, a new site was opened in 1925 at Cormorant Lake. A committee of RCAF, forestry and survey officers that had been appointed to consider extension of aerial work in northwestern Canada had recommended that forest patrols be extended westward from Lake Winnipeg to the Athabaska River to meet a projected expansion northward of the patrols from High River. Initially it had been proposed to re-open the sub-base at The Pas, which had been used in 1922-23, but flying from the Saskatchewan River presented difficulties and a more suitable site was found at Cormorant Lake about 40 miles northwest of The Pas, in the Narrows between Cormorant and Little Cormorant Lakes at Mile 42 on the Hudson Bay rail line. (8) All four bases were provided with standard radio stations, replacing the semi-permanent buildings with military equipment which had been used since 1922. For aircraft the bases had seven "Vikings", the type on which all the work had been carried out in 1924, and nine of the new Avro "Viper" seaplanes. The latter type was used for forest fire detection patrol, while the larger "Viking" was used for photography and fire suppression work. F/L H. Edwards was in command at Victoria Beach, F/L G.R. Howsam at Norway House, and F/L L.F. Stevenson at Cormorant Lake.

Well over half of the flying done by the operational bases was on forest patrol, Victoria Beach logging 355 hours, Norway House 239 and Cormorant Lake 254. Each sub-base had two "Vipers" for detection patrol, and one "Viking" for suppression of fires; the other three seaplanes and two "Vikings" were held in reserve (9) The Avros were all equipped with wireless telephone transmitters. Forest patrols began from Victoria Beach on 16 May. Three days later twelve fires were discovered whereupon all aircraft were immediately brought into service for suppression work and the other sub-bases were opened as soon as ice conditions permitted. The Pas started operations on 25 May and Norway House one day later. Despite the large number of fires early in season, the year as a whole was abnormally wet and the total number of fires detected was 67. Through the wireless stations operated by the R.C.C.S. the forestry and air service headquarters in Winnipeg were able to direct the patrol and suppression operations.

Further extension of the forest work westward was being considered and a district forest inspector was carried on reconnaissance flights over northern Saskatchewan to survey the territory.

The Manitoba units did over 60% of the R.C.A.F.'s forest patrol work in 1925 and they also had the lion's share of the

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(8) The site was reserved by the Department of the Interior for the used of the Department of National Defence under authority of P.C. 1851 of 21 October 1925; it was transferred to the latter department by P.C. 757 of 9 April 1930.

(9) Two more "Vikings" were continuously employed on photography.

photography, 311 hours out of the total of 672. Two "Vikings" were employed on these operations, and they gave very little trouble although the load carried was usually within a few pounds of the maximum permissible weight of 5800 pounds. With this load the performance of the aircraft was greatly reduced, much time being lost in climbing to the working altitude of 5,000 feet. Every item of equipment had to be carefully considered to ensure that only essentials were carried. On operations over such unsettled country, where mechanical trouble might mean a forced-landing many miles from civilization, it was of course essential to carry an emergency outfit of supplies and equipment. A navigator was also essential, a land surveyor with long experience of travel in the north who could guide the aircraft over the maze of waterways, make survey notes for interpretation of the pictures and, if necessary, ensure the safety of the crew in case they were stranded. The pilot and the mechanic were likewise indispensable. The only solution to the weight problem, therefore, appeared to be to reduce the crew from four (pilot, navigator, photographer and mechanic) to three by training the mechanic to serve also as photographer.

Most of the aerial survey work was oblique photography for the Topographical Surveys Branch for use in the revision and completion of maps. In the past oblique photographs had been taken in groups of three: the practice now was to take a set of five every three miles, one straight ahead, and two to either side. (10)

The value of aerial photography for the revision of maps was strikingly demonstrated when a new complete map was published of the mineral area lying on either side of the Manitoba - Ontario boundary. Previous maps of the area were largely blank and marked "unexplored". Following publication of the new map, prospectors were able to travel with certainty through the district and important mineral discoveries were made at Red Lake and other points. Timber types were marked on the map which was of great value to foresters also.

Originally it had been planned to photograph 50,000 square miles in the Manitoba area during 1925, but the weather was unfavourable through much of the season, low cloud or haze often detaining the aircraft for long periods at the refuelling points. Nevertheless a new record was set of 38,000 square miles done in 310 hours' flying. The principal areas photographed were in northwestern Ontario and eastern Manitoba, along the Hudson Bay rail line from The Pas to the terminal at Port Nelson, and along the Saskatchewan River and other waterways westward into Saskatchewan.

The conditions encountered by the photographic crews on their operations far from base are well illustrated by the experiences of the crew that photographed the rail line between The Pas and Port Nelson. The trip took nine days, 3 to 12 September, seven days being spent on the ground en route, waiting for suitable weather. On arrival at Port Nelson it was apparent that facilities for mooring and sheltering the aircraft were poor. After carefully examining the area, the pilot finally made a landing near the bridge and taxied the aircraft close to one of the piers where it was just touching the mud bottom at high tide. The

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(10) A description of aerial survey methods is given in Report on Civil Aviation, 1925; pp. 64-5.

next problem was refuelling, as the gas cache was at the R.C.M.P. barracks almost two miles away from the bridge head. By use of a relay of a truck, flat cars and another small truck two barrels of gasoline and a drum of oil were pushed along the narrow gauge railway track from the barracks to the bridge. By the time this laborious task was finished, night had fallen and refuelling of the aircraft was postponed until morning. That proved to be another tedious chore as the barrels could not be brought to the water's edge because of large rocks, and the crew were forced to carry the gasoline down the river bank in small buckets. While the work went on the tide ebbed, making it necessary to keep pushing the aircraft out into the water to avoid taxiing over the mud.

Transportation flights were made for a treaty money party from Norway House to Cross Lake, Oxford Lake, God's Lake and Island Lake, and the provincial health officer was flown from Victoria Beach to Long Lake to inspect sanitary conditions in the mining camps there; he was able to complete in one hour by air a journey that would have taken at least eight days by other means of transportation. Four mercy flights were also made by pilots who, in the course of their normal activities, found people at isolated points in urgent need of medical attention. On 22 May a mining engineer, seriously ill with pneumonia, was flown from Long Lake to Victoria Beach so that he could be taken to hospital in Winnipeg. Two months later, on 28 July, a miner who had severely lacerated his foot was brought in from Beresford Lake to Victoria Beach where the station doctor performed an emergency operation. The wife of the Hudson's Bay Company factor at Island Lake, who was too ill to travel by canoe, was transported to Norway House on 14 August, and a sick Indian was flown from Reed Lake to the sub-base at Cormorant Lake on 7 September.

In earlier years aircraft had been used in British Columbia in experiments to investigate the transmission of disease spores by air. In the spring of 1925 the Department of Agriculture enlisted the aid of the R.C.A.F. for similar experiments in the prairies in the study of wheat rust. Owing to the pressure of other work it was not possible to undertake special flights, but arrangements were made to expose spore-trapping slides during flights on routine operations from High River and the Manitoba bases. (11) During July, August and September about 40 flights were made from Victoria Beach, Norway House and Cormorant Lake to expose slides at altitudes of 2,000 to 5,000 feet during forest patrols. The slides, mounted on little wooden paddles, were exposed by the pilot for fifteen minutes; it required considerable energy to hold a paddle above one's head for fifteen minutes in a slipstream of about 75 miles an hour and F/L L.F. Stevenson suggested that a streamlined paddle with blunt face and tapered back to disperse the eddies might lessen the strain on the pilot's arm.

Dr. D. L. Bailey, the pathologist in charge of the Rust Research Laboratory at Winnipeg, described the results of the year's work as "quite striking": the experiments had established that the wind disseminated rust spores over large areas and for considerable distances, even 300 miles from the nearest large cereal-growing region. "This could account in large measure for the almost miraculously sudden appearance of rust over large areas." The tests also strengthened the belief that the initial infections

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(11) Operation Orders C. 3 (High River) and F. 4 (Winnipeg) of 25 and 27 April 1925.

in Manitoba each year were caused by wind-borne spores from the south. Dr. H. T. Gussow, the Dominion Botanist, added that "the work done by the Air Service.....will commend itself to scientific investigators everywhere, because of the valuable and divers application of the science of aeronautics as an aid to solving problems not possible by any other means." The officials were anxious to continue their investigation of the wheat rust problem and said that special flights would be most helpful to give the continuity and range of data required; the suggestion was also made that some tests be tried of the use of sulphur dusting to control grain rust. The R.C.A.F. regretted that special flights could not be undertaken, but offered to continue the spore-trapping work on routine patrols. (12)

The pilots engaged on operations in Manitoba during 1925 were F/L H. Edwards, P/Os R. Slemon, F.G. Wait and W.C. Weaver at Victoria Beach, F/L G.R Howsam, F/O Apps, and P/O A. Lewis at Norway House, and F/L L.F. Stevenson, P/Os B. G. Carr-Harris and E.J. Durnin at Cormorant Lake.

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(12) See AFHQ file 1008-17-2, vol. 1, and Report on Civil Aviation, 1925; Appendix C (pp. 88-92.)

Ottawa

The Ottawa air station, which had been located at Rockcliffe since the summer of 1920, was moved a few miles upstream in May 1925 to a new site at Shirley's Bay, or South March, adjacent to the Connaught Rifle Ranges. Unlike Rockcliffe, the new base had no facilities for landplanes and the station did all its flying - about 344 hours in 1925 - on a varied collection of flying-boats and seaplanes, which included an H S2L, a "Viking", a "Vedette", a "Varuna", and two Avro seaplanes. The station staff consisted of three officers and 23 airmen.

Photography was the major activity at Shirley's Bay, involving 126 hours of flying for the National Defence and other departments. On one operation the HS2L took oblique photographs along the Rideau Canal from Kingston to Ottawa. Vertical photographs for the preparation of mosaics were taken over the Central Experimental Farm in Ottawa and the Petawawa Forest Reserve, the latter operation being part of an experiment by the Forestry Branch of the Department of the Interior to test the feasibility of forest type mapping from the air.

From the earliest days in 1920 Ottawa air station had been the centre for the service's experimental and test work. During 1925 three new types of aircraft were given test flights at Shirley's Bay. The Avro single-float seaplane powered by a Wright "Whirlwind" engine was put through a series of tests, and the first Vickers "Vedette", which had been delivered by the manufacturer in the late fall of 1924, was also given service trials in the spring of 1925. On successful completion of these trials the "Vedette" was used during the summer on a series of operations to determine its suitability for different types of work; it gave complete satisfaction. Late in the fall another experimental type, the Vickers "Varuna", was flown from Montreal to South March and began a series of trials. Owing to the early freeze-up of the Ottawa River it was not possible to complete the whole programme, but the preliminary tests showed "great promise" for the aircraft.

Some transportation flying was also done from Shirley's Bay, much of it being for Field Marshal Earl Haig during his visit to Canada. Other activities included practice flying, instruction and service operations.

Dartmouth

The air station at Dartmouth which had been put on care and maintenance during the winter was reopened in the late spring of 1925 with a small staff of three officers and nine airmen to operate two HS2L flying-boats. In the five months that the station was open it flew 115 hours, most of the time (71 hours) being on photographic work in continuation of the previous year's mapping operations. Although an extensive programme of aerial survey had been planned for the maritimes, the results were very disappointing due to unfavourable weather which made photography impossible for many weeks during the summer and autumn.

After several unsuccessful attempts a mosaic was finally completed of forest lands near Fredericton belonging to the University of New Brunswick, but a second operation in that area had to be abandoned after the aircraft waited at Fredericton for almost a month in a vain hope for suitable weather. Conditions were no better in Nova Scotia. The largest operation planned there was a continuation of the oblique photographic work in the

southwestern part of the province, but after nine hours' flying the operation was suspended because cloud and fog made photography impossible. Likewise in the Windsor area the weather was most adverse, only two days being suitable for photography, and even then high cross winds prevented use of the camera except while flying in one direction. The most successful operation was around Yarmouth where, after many delays, about 140 square miles were photographed for map revision.

In addition to an aerial demonstration at Liverpool, N. S., the station did some service flying, including several artillery co-operation exercises.

Photographic Section

The expansion of aerial survey operations gave increasing importance to the service's Photographic Section. Small in size, numbering only 16 - two photographic officers, a warrant officer in charge of stores, and 13 airmen, the section was a unit complete in itself. It supplied the photographic material and instruments required by other units, trained personnel for photographic work, and supervised operations carried out at all stations. Ordinary plates and films were developed and printed locally by the units concerned, but the processing of large rolls of film was centralized in the Photographic Section. During 1925 it handled 255 of these rolls, each 75 feet in length and containing 115 7 x 9 inch negatives; from the 29,000 negatives more than 50,000 prints were made. The section was accommodated in the Elgin Cottage in Ottawa, and the service proudly boasted that probably "nowhere in the world has there been concentrated a larger output of photography for aerial survey purposes" than in that building. (13)

In August 1925 Colonel Winterbotham, chairman of the British Air Survey Committee, visited Canada to obtain first-hand information of Canadian methods in that field of activity. He was greatly impressed by what he saw at headquarters in Ottawa and at the operational bases in the west, and in his report to the committee paid tribute to Canada's work in air survey.

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(13) Report on Civil Aviation, 1925; p.78. Elgin Cottage was located on the north side of Albert Street, just west of Elgin.

Chapter X

A. Parliament 1926

On 29 October 1925 a general election was held to select the members of Canada's 15th Parliament. The results were unfortunate for Mr. Mackenzie King's Liberal government. It lost 16 seats while the Conservative opposition led by Mr. Meighen gained 66, most of the gains being at the expense of the Progressive party.(1) With the support of the Progressives, Mr. King had a slim majority in the House of Commons and he chose to remain in office. The new parliament met for its first - and only - session on 7 January 1926. It was a stormy one. Before the Air Force estimates came up for consideration Mr. King's government was defeated in the House and, when the Governor-General declined his request for dissolution and another election, Mr. King resigned on 28 June 1926. Mr. Meighen was then sworn in as prime minister and formed a temporary ministry in which the Hon Hugh Guthrie held the National Defence portfolio. Two days later (1 July) the Conservative ministry was defeated; the House then adjourned and the next day parliament was dissolved preliminary to another general election which Mr. King fought on the "constitutional" issue of the Governor-General's action. As the estimates had not been passed before parliament dissolved, necessary expenditures during the period July to November 1926 were covered by Governor-General's warrants. The total amount appropriated was $2,198,000, an increase of $300,000 over the previous year.

During the session, discussion of the Air Force was limited to questions asked by members, all of which concerned the civil operations carried out by the RCAF for other departments and particularly rumours that some of this work might be abandoned. Two British Columbia members, W.G. McQuarrie of New Westminster and A.W. Neill of Comox-Alberni, were disturbed that the "very effective" salmon fishery patrols might be stopped. To their protests the Minister of Marine and Fisheries (the Hon. P.J.A. Cardin) replied that he would investigate the situation and confer with the Department of National Defence to continue the service.(2)

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(1) The composition of the 14th Parliament was 117 Liberals, 50 Conservatives, 64 Progressives and 4 others (total 235). The 15th Parliament, which had been increased to 245 seats, included 101 Liberals, 116 Conservatives, 24 Progressives and 4 others.

(2) Hansard, 1926 Session; Vol. III; pp. 3011-12; Vol. IV, p. 3151. Nevertheless the patrols were virtually discontinued in 1926; see below.

Similar concern was expressed by British Columbia and Alberta members (J.A. Clark of Vancouver-Burrard, R.B. Bennett of Calgary, and G.G. Coote of Macleod) that the forest patrols from Jericho Beach and High River were to be suspended. The Minister of National Defence (the Hon. E. M. Macdonald) was non-committal, saying that the whole question of the air service during the coming season was under consideration, but the Minister of the Interior (the Hon Charles Stewart) was more definite:

> "Perhaps it was unfortunate that any intimation should have been given that the service was to be withdrawn. Arrangements will be made for this service at High River and, in order to satisfy other gentlemen who may be perturbed, at Le Pas. In fact, where-ever any service was carried on it will be continued this year." (3)

Recurrent suspicions, which some members entertained about the advisability of civil air operations being carried out under the aegis of a military department, were reflected in another query whether the air service was to be placed under the control of the Department of the Interior. The reply was a terse "no."(4)

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(3) Ibid.; Vol. III, pp. 3011-12; p. 3117.

(4) Ibid.; Vol. IV, p. 3403.

B. Royal Canadian Air Force 1926

By the close of the 1926-27 fiscal year the RCAF had added 50 new members and had virtually reached its authorized Permanent establishment of 95 officers and 375 airmen. By 31 March 1927 there were 468 all ranks on strength, almost 40% of whom (181) were stationed at Camp Borden; the others were distributed - Ottawa (headquarters, No. 3 Squadron and depot) 147, Winnipeg 73, High River 38, Vancouver 17, and Dartmouth 12. There were also 44 Army personnel who were paid from RCAF funds. Most of them - four officers and 32 other ranks - were attached from the Royal Canadian Corps of Signals to operate the RCAF radio system at Ottawa, Camp Borden, Winnipeg, Lac du Bonnet, Norway House, Cormorant Lake and High River; the others were from the RCAMC, RCASC and Instructional Cadre.

The organization of the RCAF still consisted of Air Headquarters and No. 1 Depot at Ottawa, No. 1 Flying Training Station at Camp Borden, No. 1 Wing at Winnipeg and five operations squadrons at Vancouver, High River, Ottawa, Dartmouth and Manitoba bases. Due to lack of funds, however, No. 4 Squadron at Dartmouth was inactive this year, and No. 1 Squadron at Vancouver was sharply reduced both in flying operations and strength. The fishery patrols on the British Columbia coast were suspended for lack of suitable aircraft and the strength was cut to two officers (S/L Tudhope in command and F/O A.J. Ashton, stores officer) and nine airmen. The other personnel were transferred to Ottawa and Camp Borden, except some airmen who, unwilling to leave Vancouver, purchased their discharge.

No. 1 Wing moved its main operational base from Victoria Beach, in use since 1921, to a new site at Lac du Bonnet on the Winnipeg River; Norway House and Cormorant Lake were the other summer bases. In Alberta No. 2 Squadron at High River began using Rocky Mountain House as the northern landing ground for forest patrols in lieu of Eckville. The squadron also undertook winter flying tests at Edmonton to determine the effect of extreme low temperature on the operation of two Siddeley "Siskin" aircraft on loan from the Air Ministry. (1) The Siddeley (or Armstrong-Whitworth) "Siskin" was one of the first post-war single-seater fighters produced for the RAF. The RCAF subsequently acquired a number of "Siskins", between 1928 and 1931, and they were the only fighters in the Canadian service until the Hawker "Hurricane" came into use early in 1939.

During the year the RCAF flew 5229 hours, a small increase of about 117 hours over the previous year. Although the amount of flying on civil operations decreased, service flying continued to expand and accounted for 2824 hours, or 55%, of the total. Most of the service flying was on training courses at Camp Borden which had now been expanded to include various refresher courses as well as provisional pilot officer training.

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(1) Thirty years later the RCAF was still conducting winter flying trials for RAF aircraft.

In the fourth year of the P/P/O scheme the number of trainees decreased from 55 in 1925 to 41 in 1926. The new intake numbered twelve, nine of whom were COTC cadets and three RMC gentleman cadets. One member of this course, P/P/O R.B. Brown, was killed in a flying accident in his third term. Six - W.G. Brown, E. Hickson, E.A. McGowan, E.A. McNab, V.H. Patriarche and G.L. Peart - completed the three year course and received their wings in August 1928. Seventeen P/P/Os were enrolled for the second term in 1926, and twelve for the third term. (2) P/P/O A.W.B. Stevenson, one of the third term pupils, was killed in a flying accident at Richmond Hill, Ont., on 27 July 1926, when his Avro crashed into a windmill while the pilot was doing unauthorized low flying on across-country flight. On completion of the course in September 1926 seven P/P/Os received their pilot's flying badge and three, W.H. Irvine, R.E. McBurney and John Moar, were subsequently commissioned as pilot officers.

In addition to the P/P/O courses during the summer No. 1 Flying Training Station at Camp Borden gave a refresher flying course for ten officers and a three-weeks flying instructors course for seven. The latter course, apparently the first formal course of that type given in the RCAF, was conducted by F/L Brookes, F/L Grandy and F/O de Niverville as instructors with S/L Shearer, F/Ls Hewson and McEwen, F/Os Harding, Hull and Fullerton and P/O Middleton as pupils. The station also gave a flying training course for nine commercial pilots. In preparation for civil operations a seaplane training course was conducted at Vancouver early in 1926 for four officers, P/Os R.M. Carr-Harris, W.J.G. Holland, B.F. Johnson and W.D. Van Vliet, who had recently qualified for their wings on landplanes at Camp Borden.

No. 1 FTS, in addition to the flying training courses, also gave a variety of ground courses which included two-weeks radio and wireless telegraphy training (nine officers and one NCO), four-weeks parachute training (two officers and five airmen), one-month NCO.s drill course, and two one-month storekeeping courses (31 airmen). Another parachute course was given at Vancouver, during which six of the station personnel made practice jumps over Sea Island; High River also gave two courses for parachute riggers.

For combined training with the other services Camp Borden held a three-weeks artillery co-operation course in October which was attended by seven Army, one RCN and four RCAF officers; 52 hours were flown during the course. Shorter artillery co-operation courses were also given at Niagara and Sarcee Camp during the summer, followed by a three-weeks militia staff course at Sarcee; the flying time on these three courses was 23 hours.

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(2) The DND Report for 1926-27 states that there were nine in the third term, but A.P. and R.s show twelve P/P/Os appointed for that term.

The number of RCAF officers receiving instruction in RAF schools was considerably increased this year with eight officers posted to "courses abroad". In addition to two students, S/Ls Breadner and Croil, at Staff College, the RCAF had one officer (F/O G.K. Trim) at Central Flying School for the flying instructors course, another (F/L F.C. Higgins) in the navigation course at Calshot, and yet another (F/O F.S. Coghill) attending the army cooperation course at Old Sarum. The senior stores officer, S/L S.G. Tackaberry, took a year-long storekeeping course at Cranwell, and one of the technical officers, F/L A. Ferrier, was selected for an aeronautical engineering course in the Imperial College of Science. Finally, S/L W.R. Kenny, who had succeeded W/C Barker as RCAF Liaison Officer at the Air Ministry, (3) became the first Canadian officer to attend the Royal Naval Staff College at Greenwich. F/L H. Edwards then took over the post of Liaison Officer. (4)

The Army Directorate of Engineer Services expended $93,921 from RCAF funds on the construction and repair of buildings, including the movement of a building from Victoria Beach to Lac du Bonnet and the preparation of grounds and construction of a slipway at the new site, the erection of a new engine test house and various other improvements at Victoria Island, the construction of a quartermaster's store, ice-house, launching way and stone cribs at Shirley's Bay, and repairs to the hangar roofs at High River. Through the Director of Contracts 21 aircraft and 58 engines were purchased for forest patrol, photography and training, as well as other equipment such as cameras, films and spare parts; 12 aircraft were also reconditioned under contract.

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(3) W/C Barker returned to Canada at the end of June 1926 and two months later resigned his commission to return to civil life. He was killed in a flying accident at Rockcliffe on 12 March 1930 while demonstrating a Fairchild aircraft for government officials.

(4) In addition to the RCAF officers at RAF schools, an RCAMC officer was attending the RAF Medical School. The RCAMC, it will be recalled, provided medical service for the RCAF, including the detachments or sub-bases at Lac du Bonnet, Norway House and Larder Lake.

C. Civil Air Operations 1926

In May 1926 a Committee on Civil Air Operations was created to replace informal inter-departmental conference which in the past had planned the RCAF's civil flying activities. (1) The duties of the new committee were defined as:

> "To recommend methods and organization for carrying out all civil air operations; to submit a program for civil operations on a three-year basis, including the necessary details as to allocation of bases, aircraft, etc.; to analyse the expenditures and progress made in carrying out such program from time to time; when necessary to visit the various stations to study requirements for improving air operations and meeting unforeseen circumstances; and to submit a report each year on the progress made."

Col O.M. Biggar, K.C., who had been Vice-Chairman of the old Air Board from 1919 to 1922, was appointed chairman of the new committee, the other members being the Director of Forestry, the Chief Aerial Surveys Engineer and the Assistant Director from the Topographical Survey Branch, and the Director (G/C Scott) and Secretary (J.A. Wilson) of the Royal Canadian Air Force. The committee held ten meetings during the year.

Civil air operations decreased by about 150 hours during the year, falling from 2440 hours in 1925 to 2294 in 1926. Forestry patrol and reconnaissance still held first place on the program with a total of 1176 hours, or almost one-half of all the civil flying by the RCAF. Although the forestry work had decreased somewhat from the previous year, particularly in the High River area, photographic operations continued to expand, rising to about 1000 hours on various tasks for the Topographical Survey Branch and other agencies. The area photographed reached 59,000 square miles, an increased of almost 25%, 50,300 square miles being covered by oblique photography and 8,700 by vertical. Vertical photography, used in the preparation of one-mile-to-the-inch scale maps, was done only in Alberta, Ontario and Quebec, the largest operation being in the Rouyn mining district where 5,650 square miles were completed during the year. Oblique photography, carried out by flights of "Viking" and "Vedette" flying-boats in Manitoba and Ontario, was used for four-miles-to-the-inch maps, seven sheets being produced from the 1926 photographs which were of great value to the forest service and mineral prospectors. During the year 41,703 negatives were exposed, including 20,249 by units of No. 1 Wing in Manitoba, 14,619 by No. 3 Squadron at Ottawa, 5,289 by No. 2 Squadron at High River, and 1,546 by No. 1 Squadron at

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(1) P.C. 677 of 3 May 1926.

Vancouver. Since the start of photographic operations in 1920 the air service had photographed a total of 152,560 square miles, or 4% of the Dominion's total area.

In addition to forestry patrol and aerial photography, civil operations in 1926 included transportation for Indian agents and other government officials, investigation of the white pine blister rust and wheat rust, and some customs patrols; but the fishery protection service on the Pacific coast virtually ceased this year due to the lack of efficient aircraft for this type of work. The lack of these patrols from the sub-base at Prince Rupert was severely felt by the Fishery Service which hoped that the suspension was only temporary. "Experience shows that by no other means can the operations of the fishing fleets be so well controlled." (2)

Almost 65% of the civil air operations in 1926 were carried out by the three bases in Manitoba. High River flew 417 hours (250 hours less than in 1925), Ottawa 344 (an increase of 250%), and Vancouver 116 (only one-third of the previous year's total). The station at Dartmouth was not opened this year.

The RCAF radio system, operated by four officers and 32 men attached from the RCCS, included a new ground station at Lac du Bonnet replacing the one used in previous years at Victoria Beach. The other stations were Ottawa, Camp Borden, Winnipeg, Norway House, Cormorant Lake and High River ; due to suspension of the fishery patrols the stations at Vancouver and Prince Rupert were not opened in 1926. After flying operations ceased the stations in the Manitoba system were kept open, with a decreased staff, to handle commercial traffic during the winter months. (3)

Vancouver

Flying operations at Vancouver were sharply reduced in 1926, decreasing from 566 hours in 1925 to a total of 225, about equally divided between civil duties and service flying. The staff was cut to three officers and eight airmen, with only two old HS2L flying-boats, one of which was in continuous operation and the other held in reserve. A "Viking" was temporarily loaned from Winnipeg for the annual spring training course for pilots. The war-time HS2Ls had now so limited a useful life that much of the work done in earlier years had to be suspended.

The major civil operations were forest disease investigation (30 hours), photography (30 hours), forestry patrol (24 hours) and preventive patrols (20 hours). On the investigation of blister rust and bud worm that attacked white pine

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(2) Report on Civil Aviation, 1926; p. 46.

(3) For a description of the radio communication system see Report on Civil Aviation, 1926; Appendix A (pp. 67-77).

and aeroplane spruce, flights were made to Alta Lake, Harrison Lake, Lillooet Lake, Bella Bella, Ocean Falls and other points to expose spore-trapping slides and to transport Mr. A.T. Davidson and other scientists, American as well as Canadian, who were engaged in study of the disease. (4) For the Topographical Survey Branch photographic operations were undertaken in the southern part of Vancouver Island, but smoke from forest fires delayed the work to such an extent that the program could not be fully completed. Some flights were made for the provincial Department of Lands to enable forestry officers to observe fire fighting measures during the high hazard season; forest conservation propaganda was also distributed by air as in previous years, and some photography was done around Vancouver for the department. Flying-boats on preventive patrols for the Department of Customs and Excise met vessels inbound from the Orient outside Victoria and kept them under observation until they docked in Vancouver; these patrols were largely responsible for several valuable seizures of narcotics.

Fishery patrols, which had constituted so large a part of the station's work in 1925, were almost completely discontinued in 1926 as the cost of providing modern aircraft for the service was higher than the Department of Marine and Fisheries could recommend despite the acknowledged value of the patrols. A few flights were made in the southern district, using a base at Smith's Inlet "under most unfavourable conditions". On these patrols which totalled only 11 hours, the crew of the flying-boat reported three violations of the week-end closed season.

S/L Tudhope was in command of the station at Jericho Beach through the year.

High River

No. 2 Squadron at High River, under the command of S/L Cuffe, was also less active in 1926, partly because of the lack of suitable aircraft and partly because of unfavourable weather. The staff of the station consisted of two officers and 25 airmen, with five Avros for forest patrol and two D.H.4Bs modified for photographic work. The station also had two Armstrong-Whitworth "Siskins" on loan from the Air Ministry for winter flying tests.

In 1926 the station flew 501.20 hours, of which 417.10 were on civil operations and the balance on service flying. Fire detection patrols accounted for 261.45 hours, almost 63% of the civil work. This figure, however, was only 55% of the previous year's forestry service, lack of funds for the purchase of new aircraft more suitable for the work necessitating a major curtailment in the program in the early months ofthe year. This was particularly unfortunate as the fire hazard was high in April and May; later in the summer when bad

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(4) Operation Order B.4 of 18 May 1926.

weather reduced the hazard only three fires were reported, two of which were within the boundaries of the forest reserves. Pincher Creek was still in use as the landing-ground for the southern patrols, but in the north Rocky Mountain House replaced Eckville as the refuelling point.

The continuous bad weather during the summer months which reduced the fire hazard also had the effect of considerably hampering the photographic operations; smoke haze from fires burning in the interior of British Columbia was a further handicap. Much valuable time was lost waiting for better weather with the result that all the program originally planned could not be completed. The de Havilland crew employed on vertical photography during the season flew 132.40 hours to cover 2550 square miles in southern Alberta and central Saskatchewan, for the Topographical Survey and Dominion Water Power Branches. Working at 12,000 feet, the aircraft photographed the Turner Valley oilfields, the northern irrigation district, Lethbridge, Calgary, St. Mary's River and Waterton Lake, Battleford and Prince Albert.

Minor operations from High River included taking motion pictures in Banff National Park for publicity use, and exposing glass slides to trap wheat rust spores in the upper atmosphere; the latter work was done during normal activities.(5)

Manitoba

No. 1 Wing under the command of S/L G.O. Johnson moved its major operational base this year from Victoria Beach to a new site at Lac du Bonnet on the Winnipeg River about 70 miles northeast of Winnipeg. The northern sub-bases at Norway House and Cormorant Lake were still in use. The Avro seaplanes and "Viking" flying-boats were supplemented in 1926 by two of the new "Vedettes" fitted with 200 h.p. Siddeley "Lynx" engines which made their debut in the field towards the end of the season and embarked at once on photographic and forest type-mapping operations. The total flying time from all three bases was 1652½ hours, of which 1417 were on civil operations, both figures being about 200 hours higher than those for the previous year. Forestry operations accounted for over 60% of the civil flying, aerial survey for one third, and transportation and miscellaneous duties for the remainder.

On forestry operations 886 hours were flown, including 29 for photography for the Forestry Branch. Each of the three bases was equipped with two Avro seaplanes for detection patrols and one "Viking" for fire suppression work; one additional aircraft of each type was held in reserve. Due to an abnormally wet season less flying was required than would be expected in normal years, and weather conditions were studied closely to eliminate unnecessary operations. After studying the weather reports received by wireless from the local forest inspectors and the forecasts of the Meteorological Service, the District Forest Inspector at Winnipeg advised the C.O. of the Wing what patrols would be required for the next day or for a longer period if conditions appeared to be stable. Orders were then sent to the bases; the officers in charge of the

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(5) Operation Order C. 6 of 18 May 1926.

bases were given discretion to cancel patrols if weather conditions changed or, alternatively, to send out additional patrols if they seemed advisable. When a detection aircraft reported a fire, the suppression flying-boat, which was kept ready for instant departure, was despatched to the scene with a fire-fighting crew and equipment. The district fire ranger assumed responsibility for fighting the fire, and if he required, more flights would be made to bring additional men, gear and supplies to the fire fighters.

During the year 256 fires were detected in the 53,000,000 acres of forest covered by the patrols. Lac du Bonnet reported 117 fires in the area surrounding Lake Winnipeg as far north as Berens River. In the area from Berens River north to the Hudson Bay rail line 33 fires were spotted by Norway House patrols, and Cormorant Lake counted 106 in the areas extending northwest from Lake Winnipeg; across the northern part of Lake Winnipegosis and into eastern Saskatchewan. The flying time by the three bases was: Lac du Bonnet 362.25 hours, Norway House 197, and Cormorant Lake 293.

The first fatal flying accident on Manitoba operations occurred on 19 August 1926 when P/O R.M. Carr-Harris was killed in the crash of an Avro seaplane at Mile 185 on the Hudson's Bay Railway. The pilot was taking off from the Lake for a forestry patrol but did not allow sufficient distance to clear the trees at the water's edge. Carr-Harris had been commissioned in the Permanent RCAF upon graduation from RMC in June 1924, and had won his wings in December of that year. At the opening of the operational season in 1926 he was posted from Camp Borden to No. 1 Wing and assigned to "B" Flight at Norway House.

Topographical survey photography consumed 483 hours of flying. As a result of experience gained in previous years a special photographic flight was formed in 1926, consisting of two "Vikings", two pilots, a photographic officer, two surveyor - navigators, two photographer - mechanics and a cook.(6) The flight was entirely self-sustaining, carrying a camping outfit, provisions, spare parts, rolls of film and other necessities so that temporary bases could be established wherever required. All work was done on the spot by the unit except the developing and printing of the photographs. The experience of 1926 showed that this work also should be done in the field, and experiments were started to develop suitable equipment for use in 1927. The practice of sending out self-contained photographic flights became standard procedure from this time on.

Operations of the "Viking" flight began on 3 June, the first task being to take oblique photographs of 1,400 square miles southwest of Lake Winnipeg for use in map revision and timber type mapping. On completion of this assignment, the flight moved on 8 June to a temporary base on Lake St. Joseph in northwestern Ontario, where a gas cache had been laid down

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(6) F/Os L.R. Charron and G.F.M. Apps were the pilots; R.D. Davidson and Eric Fry the surveyors, Sgt. A.J. Milne and Cpl. R. Marshall the photographer - mechanics.

during the winter. The main operation here was oblique photography from 5,000 feet in continuation of work done in 1925 to cover an area of about 25,000 square miles in the Red Lake district, east and north to the eastern end of Lake St. Joseph, and from Sioux Lookout north and east to the eastern shore of Lake Nipigon. From Lake St. Joseph the flight moved to Sioux Lookout on 14 July, and thence to Collins where it remained until the middle of September.

An illustration of the degree of improvisation required on these detached operations is provided by an incident which occurred to one of the "Vikings" late in August. While in flight the aileron control rod under the pilot's seat fractured near the universal joint, but by use of the rudder the pilot was able to make a safe landing on a lake nearby. As the weather was very good for photography the crew did not want to waste any time so temporary repairs were effected by inserting a piece of birch into the rod and securing it by four nails. The photographic flight was then resumed and the aircraft returned safely to the base at Collins.

Photographic operations in Ontario ended on 15 September when the flight was recalled to Manitoba to undertake another assignment for topographical and forest type mapping in the districts north and west of Lake Winnipeg. This operation had been scheduled for late in the season to take advantage of the autumn change in foliage on the birch and poplar trees which would then show the greatest contrast from the conifers. The "Vikings" reached Cormorant Lake on 17 September and, aided by continuously favourable weather, they were able to complete about 24,000 square miles by 5 October. The base was then moved to Norway House, but the weather changed and only one more photographic day was obtained before signs of impending freeze-up forced the flight to move further south to Winnipegosis on 13 October. Three more flights were made from this base; then cold weather and heavy snowfalls made it necessary to abandon operations and return to Lac du Bonnet on the 16th, and thence to the Red River at Winnipeg a week later. One final flight was made on the 27th along the west shore of Lake Winnipeg from the Red to the Icelantic river. Work then ceased for the year and the aircraft were taken ashore for their winter overhaul.

Meanwhile a second photographic flight had also started operations. When two new "Vedettes" were delivered by the contractor to Ottawa air station for their acceptance tests they were allocated to this flight and two crews (pilot and mechanic) arrived from Winnipeg to take delivery of them on 10 September. Under adverse conditions the crews ferried the aircraft to Lac du Bonnet, by way of North Bay, Sudbury, Como, Long Lac, Nipigon, Sioux Lookout and Minaki, and after being fitted with photographic equipment the "Vedettes" proceeded to Norway House where they began operations on 18 September. For a month the flight worked from this base, photographing when the weather was fine and sketching forest types when conditions were poor for photography. Then the "Vedettes", like the "Vikings", were forced to retreat to

Lake Winnipegosis and thence to Lac du Bonnet and Winnipeg, where they were dismantled for winter overhaul. In six weeks of operations in the field the two aircraft logged 62.34 hours and "were found to be admirably suited for their work." (7)

In addition to these major activities the Manitoba bases also did some transportation work, including the usual treaty money flights to carry an Indian agent and doctor to Nelson House, Split Lake, Cross Lake, Oxford House, God's Lake and Island Lake. When there was no fire hazard, forest patrol aircraft were used for timber cruising, or forest type reconnaissance, and for investigation of the wheat rust disease. As in the previous year spore-trapping slides were exposed to assist entomologists engaged in study of the wheat pest, 43 flights being made in this connection between 9 July and 5 October; 5,000 feet was the usual altitude. (8) Avro seaplanes were normally used, but some flights were made on the "Viking" flying-boats.

Ottawa

No. 3 Squadron at Shirley's Bay west of Ottawa had a staff of four officers and 17 airmen to operate a mixed complement of one Avro seaplane, one "Varuna" and two "Vedette" flying-boats; all four aircraft had the same type of engine, 200 h.p. Wright radials. The station was much more active than in earlier years, flying 659 hours in 1926, an increase of more than 300 hours over the previous season. Somewhat more than one-half of this total (343.47 hours) was on civil work, the balance being on service flying which included much experimental work as well as seaplane training and trials of new aircraft. Operations began on 13 May and ceased on 26 November when ice appeared on the river.

Virtually all of the civil flying (332 hours) was on photography in eastern Ontario and western Quebec for the Topographical Survey Branch; in addition a few small photo jobs were done for the Forestry Branch and other government offices. The major operation was vertical photography from 10,000 feet of a 6500 square mile rectangular area in the Rouyn mineral district for which a flight of three aircraft (the "Varuna" and two Vedettes") was detached to Larder Lake in Northern Ontario where a good anchorage was found near the railway line. In August one of the "Vedettes" moved to a temporary base at Senneterre, P.Q., so that the eastern part of the area could be photographed without too much extra flying to and from the major base. Good progress was made during July and August, but the first three weeks of September were poor for photography. On 20 October the advent of winter forced the aircraft to return to Ottawa.

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(7) Report on Civil Aviation, 1926; p. 58. The pilots were F/L B.N. Harrop and P/O C.R. Slemon with Messrs. Jenkins and Donnelly as navigators and Sgt Barton and LAC Ewart mechanics.

(8) Operation Order F. 10 of 18 May 1926. Most of the flights were made by F/L F.J. Mawdesley, P/O W.J. Holland, P/O W.C. Weaver, P/O W.D. Van Vliet and F/L G.R. Howsam.

Minor photographic operations were carried out around Ottawa, Hull, La Trappe and Petawawa, and along the Ottawa and Gatineau rivers and the Grenville and Carillon canals.

Commercial aircraft often used the facilities at Shirley's Bay for refuelling, repair and overhaul of aircraft and engines. On one occasion when the "Varuna" was flying to Larder Lake it carried fuel and spare parts for a commercial aircraft which had forcelanded in the upper Gatineau valley.

Aircraft

Production of the "Vedette" was now in progress, four being manufactured for the RCAF by Canadian Vickers in 1926. The first "Varuna" was also in operational use, and Vickers had produced four new designs to meet RCAF specifications for various requirements. Although none of the four passed beyond the prototype stage of development, they are of interest as examples of Canadian aeronautical design to meet Canadian requirements. The four experimental types, which were expected to be ready for testing in the spring and summer of 1927, were the "Vanessa", "Velos", "Vigil", and "Vista".(9) The first of these was a general purpose type which would be useful for commercial operations as well as for transport and communication in the RCAF; the other three types were designed specifically for the service's civil operations. All four followed the new trend in aircraft construction by using metal wherever possible in lieu of wood.

The "Vanessa" was a cabin biplane with comfortable seating capacity for four passengers in addition to the pilot, and could be fitted with wheels, floats or skis. The power plant could be either the Armstrong-Siddeley "Lynx" or the Wright "Whirlwind" 200 h.p. radial engine.

The "Velos", probably the first aircraft specifically designed for photographic survey work, was a twin-engined biplane which, like the "Vanessa", could be operated on floats, wheels or skis. It carried a crew of three - pilot, navigator and photographer - who were seated in tandem in the nose of the fuselage where they had an exceptionally good view. To give the necessary clear angle for oblique photography, the lower wing was of small span, constituting in effect a platform for access to the motors and to the floats for mooring. Metal construction was largely used, only the upper plane being of wood; the fuselage was of welded steel tubing, the tail unit and lower plane of steel, and the floats were made of duralumin. All external bracing was likewise steel tubing to avoid rigging troubles due to the stretching of wires.

The "Vigil" and the "Vista" were both small single-seaters designed for forestry patrol. The former was a biplane specially designed to replace the Avro on operations

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(9) Artist's sketches of the four types are reproduced in the Report on Civil Aviation, 1926; pp. 63-66.

in the Rocky Mountains area where flying conditions were exceptionally severe due to the "bumpy" air. Bracing of the normal type was therefore completely eliminated, and all wing bracing, both internal and external, was made of steel tubing to obviate the rigging trouble experienced on aircraft previously used at High River. The fuselage also was formed on welded steel tube, and the tail unit and lower plane were likewise steel. Although designed as landplane, the "Vigil" was adaptable for use on floats or skis. The radio equipment could be removed if necessary to accommodate a passenger.

The "Vista" single-seater flying-boat was unique in two respects: it was the first Canadian monoplane design and it was the lowest powered aircraft in the Canadian field, being designed to carry the Armstrong-Siddeley five-cylinder 60 h.p. "Genet" radial engine. Two models were being produced; in one the engine was a pusher with the pilot seated forward of the plane, while in the other the engine was a tractor with the pilot behind the single plane. Like the other experimental types it had an all-metal (duralumin or steel) airframe except for the wings. The little "Vista" gave great promise for forestry patrol, but the appearance of the low-powered de Havilland "Moth" just at this time made it unnecessary, and uneconomical, to proceed with the Canadian development.(10)

Trans-Canada seaplane flight

Although it was not a service operation, the RCAF had a special interest in a seaplane flight that was made across Canada, from Montreal to Vancouver, in September 1926. An RCAF officer served as second pilot and navigator on the flight, RCAF facilities were used at several points along the route, and the Department of National Defence became trustees of a handsome trophy which was presented as a sequel to the flight. Originator of the flight and donor of the trophy was Mr. J. Dalzell McKee, a wealthy American aviation enthusiast, who was accompanied by S/L A.E. Godfrey from Air Headquarters in Ottawa. Leaving Montreal on their Douglas floatplane on 11 September, the two men reached Vancouver eight days later, completing the 3,000 mile route in 35.08 hours flying time. Refuelling facilities and any necessary assistance along the way were provided at bases of the Ontario Provincial Air Service and the RCAF.

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(10) In addition to Canadian Vickers, the RCAF also gave contracts to the Ottawa Car Manufacturing Company for the reconditioning of Avro training aircraft and the construction of floats and other parts.

The log of the flight was:

Date	Leg	Distance	Flying Time
11 Sept.	Montreal - Ottawa	125 miles	1.36
12 Sept.	Ottawa - Lake Traverse	100 "	1.30
13 Sept.	Lake Traverse - Sudbury	175 "	1.35
14 Sept.	Sudbury - Orient Bay	415 "	4.40
14 Sept.	Orient Bay - Sioux Lookout	195 "	1.54
15 Sept.	Sioux Lookout - Swan Lake	120 "	3.06
15 Sept.	Swan Lake - Malachi Lake	20 "	.23
15 Sept.	Malachi Lake - Lac du Bonnet	150 "	.51
17 Sept.	Lac du Bonnet - Prince Albert	545 "	7.05
18 Sept.	Prince Albert - Lake Wabamun	425 "	5.14
19 Sept.	Lake Wabamun - Vancouver	730 "	7.14
		3000 miles	35.08 hrs.

During the first four days strong head winds and stormy weather with low clouds delayed the flight. From Lac du Bonnet faster progress was made and over the route from Prince Albert to Vancouver the weather was excellent. The crew reported that the whole course could be flown safely on a seaplane except for three stretches in the Yellowhead Pass and Fraser River canyon where there were no landing areas in case of emergency. In appreciation of the courtesies and assistance which he had received Mr. McKee subsequently presented to the Department the "Trans-Canada Trophy" to be awarded annually in recognition of outstanding service to Canadian aviation. Tragically the donor lost his life in a flying accident a short time later, before the first award of his trophy was made to Captain Harold A. Oaks, DFC, of Western Canada Airways. In the next three decades, 1927 to 1957, seven RCAF officers received the trophy - S/L Tudhope (1930), F/L E.G. Fullerton (1934), G/C Z.L. Leigh (1946), F/O R.B. West (1948), S/L K.R. Greenaway (1952), W/C J.G. Wright (1954), and S/L R.T. Heaslip (1956).

Chapter XI

A. Parliament 1927

In the general election on 14 September 1926 the Liberals increased their strength and the short-lived government of Arthur Meighen resigned. (1) Mr Mackenzie King returned to office as prime minister on 25 September. A fortnight later Lt. Col. the Hon. J.L. Ralston assumed the portfolio of Minister of National Defence which he was to retain through the next four years. The new parliament, the sixteenth since Confederation, met on 9 December 1926 to resume the business which had been interrupted by dissolution five months earlier. The session continued until 14 April 1927.

One of the first items to come before the house was an appropriation of $398,000 required by the air service to meet the demand from other government departments for the extension of civil operations. The item aroused some discussion concerning the allocation of the vote. The Hon. Hugh Guthrie, formerly Minister of National Defence in Mr Meighen's cabinet, suggested that, since the money was to be used for other departments, it should be charged to them; the additional sum made the air service vote very large, but that service got no benefit from it. On the other hand, Mr. A. E. Ross (Kingston City) thought that the vote would be approved by many as one way of increasing the air force. He was strongly in favour of it, and believed that the air force was a branch on which the government should spend much more money, to which a Quebec member interjected that "they are spending too much already." The Hon. C.A. Stewart, the new Minister of the Interior, ended the discussion by pointing out that Mr Guthrie's suggestion had been followed for a year or two; but as it was "not pleasing to have to vote a sum of money over which you have no control" the principle had been adopted of putting the whole vote under the air force, "they being responsible for it..." (2) A smaller appropriation of $20,000 for topographical surveys passed without discussion; the money was to be used to lay down caches of supplies for flying operations along the Churchill River and in northern Manitoba and Saskatchewan. (3)

The reduction of flying activities at Jericho Beach (Vancouver) in 1926 was referred to several times and revealed differences of opinion concerning the value of the fishery patrols. One British Columbia member thought that the "excellent service" provided by the air patrols was more effective and economical than other methods of suppressing poaching, while two other local members were less convinced of the efficiency of the aircraft because of limitations of storm, fog and night and thought that

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(1) Representation in the Sixteenth Parliament was 116 Liberals, 91 Conservatives, 13 Progressives, 11 United Farmers, and 14 others.

(2) Hansard, 1926-27 Session; Vol.-1, p. 112.

(3) Ibid.; p. 115.

more and better boats and better pay for their crews would be preferable. The Minister of Marine and Fisheries said merely that the matter was under consideration. (4) The service was not resumed by the RCAF.

In the interval between the general election and the opening of parliament an Imperial Conference had met in October and November 1926. The Prime Minister, in reporting to the House of Commons on the conference, made particular reference to the discussions on defence and imperial air communications. "Possibly no part of the conference (Mr. King said) was more impressive than that which related to the development of aerial navigation and air services, not only as factors in times of war but as agencies in the promotion of peace and progress." He was "fortunately" able to tell the conference of the marked advance which had been made by the Canadian air service in survey, forest and coastal patrol and other fields; the part played by the Canadian service was "of the highest character". To assist the United Kingdom's plans for airship experiments, the Canadian representatives undertook to say that Canada would be prepared to establish mooring masts and provide meteorological data for a trial service between Britain and the Dominion within the next year or two; that undertaking "was cordially appreciated" by the British government.

On the other hand, Mr. King was careful to point out to the house, "no commitments were made on the part of Canada with respect to defence. Indeed no requisitions were made on the part of the British government for action on the part of the dominions." The 1926 conference approved the resolution of the previous conference in 1923 to the effect that each dominion should decide upon its own defence and upon the character and extent of its co-operation with other parts of the empire. (5) Mr. J. S. Woodsworth, however, was concerned that Canada's participation in "Imperial air routes" would have the effect of tying the dominion into Imperial defence also; he urged that a distinction be made between civil and military aviation and advocated the promotion of the civil aviation branch. (6) In an attempt to satisfy the qualms of the Winnipeg member, Mr. King explained in greater detail how and why he had promised assistance to bring the first airship flights to Canada rather than to some other part of the empire. (7)

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(4) Ibid.; Vol. II, pp. 2194-5.

(5) Ibid.; Vol. II, pp. 1646-8.

(6) Ibid.; pp. 1763-4.

(7) Ibid.; pp. 1912-3.

These suspicions of entanglement in Imperial defence were again voiced when the air estimates came before the house. Mr. Henri Bourassa in particular was concerned about the "organization carried on in conjunction with the British government" and charged that the civil air force was "nothing but a training body for the preparation of a military air force." (8) After referring to the Canadian navy controversy of earlier years - whether money should be used for the defence of Canada or for a contribution to the Imperial navy - Mr. Bourassa said that if the country was undertaking "aerial preparations, not only for the defence of the country but for participation in all imperial wars in co-operation with the British nation and the other nations of the empire, it is just as well that we should know it now." Those who were not in favour of such a policy should not be given to understand that the air force vote was "merely the preparation of a civil air force and has no connection with the military air force." The Prime Minister once again emphasized that nothing had been said in the Imperial Conference "to bind us in the matter of the use of the defence forces either on the military or on the civil side". Parliament itself decided the extent, if any, of the cooperation in defence beyond the shores of Canada.

Other members advocated once more that the military and civil air services be separated. According to one member there was "a great deal of contention" between the two with the result that the country was not getting the service it might expect if they were separated. Mr E. J. Garland (Bow River) supported this theme in the face of frequent interruptions from another member who accused him of using "insulting language" to service officers. Mr Garland agreed that the civil air force had been doing "remarkable work, probably pre-eminent in their line", but he questioned whether it was "wise to continue the evolution of our civil air force within a military department". It was his opinion that red tape, the military caste system and "the disciplinarian methods of militarism" would so strangle the civil development of aviation that its propellers would not work properly. To keep civil air operations entirely out of the hands of the military, and to give more efficient and economic administration, he recommended that a department of transportation be established. Mr G. G. Coote (Macleod) agreed with this suggestion because military men "do not know the value of a dollar."

The Prime Minister intervened in the debate to say that the government had been carefully considering the separation of civil from military aviation, but had not had time to prepare the details.

> "We are entirely of one mind that the two should be separated, but as to whether they should be under a different minister than the one who now has charge of the Department of National Defence is a matter which we will have to consider further...It is proposed that civil work shall be carried on by aviators under a civil department of the government." (9)

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(8) One might with equal justice have claimed that the military air force was a training body for airmen employed on civil operations.

(9) Ibid.: Vol. II, pp. 2276-83.

The air estimates for 1927-28 may have misled some members into thinking that there were two distinct air forces, one for military operations, and the other for civil. In contrast to previous years two separate items were presented for the Canadian Air Force (Civil) and the Canadian Air Force (Service). The first item for $2,222,539 covered operations for other government departments; the second item for $1,669,694 was allocated to air force operations and training, including training for the work of other departments. (10) The total vote of $3,892,233 was the largest which the air service had yet received, and was an increase of almost $1,700,000 or 77%, over the previous year.

Mr Ralston explained that there was an increase of $675,000 in the service item due largely to the need to replace obsolete military aircraft with more modern types. Hitherto training had been carried out entirely on the same types that had been used during the war, and to maintain "reasonable efficiency" in the force it was proposed to replace them with "a very small flight" of modern machines. The total number of new aircraft to be purchased was apparently eleven, eight of which were to be stationed at Camp Borden, two at Vancouver and one at Ottawa; some were to be made in Canada, and others in Britain. In reply to some comments by Mr. Bourassa, the minister said that the only expenditure proposed for work in conjunction with the British government was a sum for the air-field and mast to be used in the experimental airship service. He agreed with another member who repeated the suggestion made earlier in the session that it would be fairer to the Department of National Defence to charge a large part of the expenditure to the other departments for which the work was done and thus avoid making the military estimates larger than they should be. (11)

In addition to the two air force votes there was an item of $850,000 in the estimates of the Department of Railways and Canals "to provide for the establishment of a patrol service to investigate the conditions of navigation in Hudson Strait and Hudson Bay." (12) The RCAF was to have a large share in this Hudson Strait expedition.

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(10) The votes included $81,570 to be expended by the Department of Public Works for the CAF (Civil), and $24,035 for the CAF (Service).

(11) Ibid.; Vol. II, pp. 2276-8.

(12) Ibid.; pp. 2147 and 2160-1.

B. Reorganization of the Air Services 1927

The opinion frequently expressed in the House of Commons that the "civil air force" should be separated from the military, and the assurance which the Prime Minister had given in April 1927 that the two services would be kept distinct, finally bore fruit in a reorganization of the RCAF on 1 July 1927 by which civil aviation was removed from the military branch and placed under the direct control of the Deputy Minister of National Defence. For the past five years, since June 1922, all branches of the government air service had been under the jurisdiction of the RCAF, service and civil air operations, supply and research, and the control of civil and commercial aviation being administered by three Assistant Directors under the Director of the RCAF who in turn was responsible to the Army Chief of Staff. This "military control" was now replaced by an organization similar to that which existed under the Air Board between 1919 and 1922. The government air services were again subdivided into four branches, service aviation, civil government air operations, aeronautical engineering, and control of civil aviation. The first of these, the RCAF, remained under the Director who was still responsible to the Chief of the General Staff (1), that is, service aviation was still under military control. The other three branches, however, were now made directly responsible to the Deputy Minister of National Defence and therefore, on paper at least, were entirely removed from "military control." (2)

Unlike the Air Board organization, however, in which the personnel engaged on civil government flying operations, the control of civil aviation, and technical and supply services were all initially civil servants employed as air station superintendents, pilot-navigators, certificate examiners, riggers and the like, the staff engaged in the new Civil Government Air operations and Aeronautical Engineering branches were officers and airmen of the RCAF. The separation of the "civil air force" from the "military air force" was more apparent therefore on paper than in actual operation. It was definitely a compromise measure which had the merit of keeping alive the RCAF at a time when there was strong anti-militaristic sentiment in the country.

Consideration was given to converting the three non-military branches to a civilian status as they had been prior to the amalgamation with the CAF late in 1922, but only one of the three branches was actually "civilianized".

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(1) The old title of CGS had been restored in lieu of the newer title Chief of Staff on 1 June 1927.

(2) DND Report 1927-28; p. 5. Air Force General Order 51 of 9 July 1927 stated that the changes in organization and administration were "to carry out the intention of the Government to place all civil government flying operations and the control and supervision of civil aviation under civil control and administration." Since 1923 the annual report of the Department of National Defence had contained one section dealing with the RCAF in all phases of its work. Henceforth, until 1936, the report contained separate sections for each of the four branches of the air services. The annual report on civil aviation, issued since 1923 in continuation of the Air Board reports, was also published until 1931, giving a separate and more detailed treatment of that phase of the government air service.

"A civil organization has been drawn up in conjunction with the Civil Service Commission for the Controller of Civil Aviation's Branch and is now awaiting approval. Vacancies and new appointments occurring in that branch in future will be filled by civilians. The reorganization of the other branches (Civil Government Air Operations and Aeronautical Engineering) is not an easy matter and requires time and the utmost care during the transition period to ensure that their important functions are not interrupted by any sudden change. The problem is being studied by the department in conjunction with the officers of the Civil Service Commission and a suitable plan of organization is being worked out. This may take some time to put into effect and it is probable that for some years the attachment or seconding of Air Force officers for civil duties will be continued in several of the positions, though it is anticipated that non-permanent officers of the RCAF who are at present only temporarily employed can be placed on a civil basis before long. The questions of length of service, pension rights, etc., do not enter into their case but permanent Air Force officers with many years' service are entitled to every protection in regard to such matters. The success of the Civil Government operation program is largely due to them and its continuance on a sound basis is dependent on their experience and knowledge of the work." (3)

The contemplated change of C.G.A.O. and A.E.D. personnel to civil status did not take place. The directorates were staffed by RCAF personnel who were detailed for duty in those branches and had their pay and allowances charged to the appropriate vote for such period of duty. The shuffling of personnel to and from CGAO must have caused considerable work for the accounting officers who had to transfer the costs from one account to the other.

In the reorganization of 1 July 1927 G/C Stanley Scott continued in office as Director, RCAF; W/C Lindsay Gordon became Director of Civil Government Air Operations, W/C Stedman remained as head of technical services with the new title of Chief Aeronautical Engineer, and Mr. J.A. Wilson was appointed Controller of Civil Aviation. More than one-half of the total strength of the RCAF was detailed for duty with the three civil branches: 274 officers and airmen to C.G.A.O., 17 to A.E.D. and 2 officers attached to C.C.A. (4)

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(3) Report on Civil Aviation, 1927; pp. 6-7.

(4) Distribution of personnel at the time of reorganization is given in Weekly Orders for 9 July 1927.

C. Royal Canadian Air Force 1927

Under the reorganization of 1 July 1927 the RCAF became the military branch of the air services. The Director (G/C Scott) remained responsible, as in the past, to the Chief of the General Staff. The function of RCAF Headquarters in the new organization was "to administer and control all military air operations and to administer and control such units, formations, detachments, etc., of the RCAF, as may be placed under such Headquarters." Initially, these units consisted of two stations, a stores depot and a communication flight. At RCAF Station Camp Borden (formerly No. 1 Flying Training Station) there were the RCAF Repair Depot, the Ground Instruction School and three squadrons (Nos. 1 and 2 for training and No. 3 for service). At RCAF Station Vancouver (formerly No. 1 Squadron) two squadrons were authorized, No. 4 for training and No. 5 for service. (1) Both the RCAF Communication Flight and the RCAF Stores Depot were located at Ottawa, at Shirley's Bay and Victoria Island.

The separation of Civil Government Air Operations, Aeronautical Engineering and Civil Aviation from RCAF administration necessitated a re-organization of Air Headquarters. Under the Director there were two Staff Officers for Personnel, and Equipment; there was now but one Assistant Director, instead of three as previously, who was served by four Staff Officers for Organization, Training, Operations and Intelligence, and Regulations. This organization remained in effect through the next three years. Upon his return from Staff College in August 1927 W/C L.S. Breadner took over the appointment of Assistant Director for Air Staff Duties.

At the time of reorganization the peace establishment authorized for the RCAF totalled 153 officers and 660 airmen, (2) with a limited establishment (approved by the Minister) of 109 officers and 512 airmen. (3) By the close of the fiscal year (31 March 1928) the actual strength had risen to 117 officers and 454 airmen, an increase of 101 (22 officers and 79 airmen) during the year. (4) More than one-half of the total strength of the service (293 officers and airmen) were detailed for duty with the other branches of the government air services, C.G.A.O., A.E.D., and C.C.A., under the Deputy Minister.

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(1) Military designations such as "squadron" were now restricted to the RCAF and were not used in Civil Government Air Operations. It was presumably at this time too that numbers were allotted to service aircraft, while aircraft used on CGAO continued to carry the last two letters of their civil registration. In actual practice the squadron designations at Camp Borden and Vancouver, although they were shown in the authorized establishments for 1927 and 1928, do not appear to have been used.

(2) P.C. 1413 of 15 July 1927 (effective 1 April 1927).

(3) Weekly Order 73 of 24 September 1927.

(4) Included in these figures were 37 officers and one airman (AC2 J.R. Staveley) of the NPAAF who were on full-time duty. The authorized establishment of the Non-Permanent remained unchanged at 67 officers and 130 airmen; no units had been formed as yet. The distribution of personnel at 31 March 1928 was: Ottawa 254, Camp Borden 174, Winnipeg 99, High River 23, Vancouver 16, Dartmouth 2, and Montreal (Aeronautical Inspection Detachment) 2. Forty-seven Army personnel (RCCS, RCAMC, etc.) were paid from

The role of the RCAF, qua se, was now essentially training in the two stations at Camp Borden and Vancouver. Ground training was concentrated at Camp Borden, where ab initio, refresher and advanced flying training on landplanes was also given. Vancouver conducted seaplane training. On completion of flying training at Camp Borden, pilots were normally posted to Vancouver for ab initio seaplane training, following which they were, in most cases, sent to one of the "civil" stations for operations. In function, then, the RCAF for the next few years served as a training school for personnel engaged on civil government air operations.

There were two major innovations in training during 1927. Two years earlier, on 5 November 1925, a scheme had been approved for the institution of technical training for boys to provide the service with qualified tradesmen. Due to the lack of funds the scheme was not inaugurated until 4 July 1927 when 20 boys reported to RCAF Station Camp Borden for two months' training during their summer school vacation. At the end of the course 16 qualified to continue training the following year. The term "boy" described not only their age, but also their rank in the Air Force. The training scheme continued until 1931 when the cut in appropriations due to the depression necessitated its cessation.

The second innovation was the introduction of pilot training for NCOs. The first course, of three months' duration, began at Camp Borden on 1 February 1927 with six airmen under instruction and A. Anderson, A.J. Horner, R. Marshall and E.C. Tennant subsequently qualified for their flying badges (5) - and promotion to the rank of acting sergeant. Except for one airman in the early CAF they were the first NCO pilots in the Canadian service. A second course for airmen pilots was started at Camp Borden on 6 October 1927 and each year thereafter until 1931 a course was conducted at the station through the winter months;(6) unlike the first course, the later ones lasted for about five months. Of the 45 airmen who were detailed for the five courses 30 won their wings. One airman was killed during training.

In the P/P/O training scheme there were 41 pupils during the summer of 1927, representing a new intake of 17, a second term of nine, and a third term of 15. The third term had a 100% record, every member of the course qualifying for the pilot's flying badge. (7) A Sword of Honour was presented this year to the outstanding member of the graduating course, the winner being P/P/O J. T. Dyment. Among the graduates who were subsequently commissioned in the RCAF were M. Costello, F.A. Sampson, C.L. Trecarten, H.M. Kennedy and S.R. McMillan. Thirteen members of the first term and eight of the second term passed their examinations at the end of the summer course.

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(5) The first three graduated on 30 April 1927; Tennant, who joined the course later than the others, received his wings on 30 May. To provide for the training of airmen pilots paragraphs 307 to 319 were added to K.R. and O.

(6) After the depression break, training was resumed again in 1936.

(7) The DND Report for 1926-7 (Page 42) states that 14 qualified as pilots, but Weekly Orders show that all 15 completed their tests and were authorized to wear wings, 31 August 1927.

In addition to these ab initio flying training courses for P/P/Os and airmen, Camp Borden gave a special refresher course in air and ground subjects for the personnel detailed for the Hudson Strait Expedition, and other refresher flying courses for 27 officers and four NCO pilots. Another flying instructors course was given to classify or re-classify 12 officers. The annual parachute course was also given. Special flying training was given to nine commercial pilots. At Vancouver seaplane instruction was provided for eleven newly qualified pilots, including two NCOs.

Combined training with the other services was curtailed owing to the re-organization of the Air Force and the unserviceability of landing-grounds at the different military camps. One short combined operation was carried out at Sarcee camp in August 1927, in conjunction with the cavalry and infantry, during which 3.15 hours were flown.

This year marked the introduction of an exchange scheme between the RAF and RCAF under which three officers were sent every other year for two years' practical experience in flying, supply or technical work with the other service. The first RCAF officers sent an exchange to the RAF early in 1927 were F/Ls E.L. MacLeod, R.J. Grant and N.F. Mossop. From the RAF came F/L W.R.B. Annesley, F/L J.A. Sadler, and F/O H.J. Young, who were assigned respectively to No. 1 Depot at Ottawa, No. 1 Wing at Winnipeg, and the Flying Training Station at Camp Borden. F/L Annesley, a technical officer as well as a pilot, was in charge of the metal workshop in the Depot until his death from natural causes on 16 August 1927. F/L H.W. Heslop then replaced him in the exchange group.

In addition to the three exchange officers the RCAF had several other officers attending service colleges and schools in the United Kingdom. S/Ls Breadner and Croil completed the fifth course at RAF Staff College in 1927 and were followed by S/Ls Anderson and Johnson for the sixth course. At the Royal Naval Staff College S/L Kenny qualified for the "q.s." symbol, which S/L Harold Edwards enrolled for the next course. F/L Alan Ferrier completed a one-year course in aeronautical engineering at the Imperial College of Science and F/L George Wait entered the new term. For specialized instruction in other fields, F/L G.E. Brookes took the flying instructors course at the RAF's Central Flying School, (8) F/L F.J. Mawdesley completed an air pilotage (navigation) course at Calshot, F/O E.E. Middleton an army co-operation course at Old Sarum, F/O A.P. Campbell an armament course at Eastchurch, and S/L S.G. Tackaberry a store-keeping course Cranwell. S/L Edwards held the post of RCAF Liaison Officer at the Air Ministry until he went to the Naval Staff College, and S/L Kenny then filled the position for a short time until S/L A.A.L. Cuffe arrived late in the year to take over.

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(8) W/C Croil also took a brief course at the school.

The total flying logged by the RCAF during the 1927-28 fiscal year was 4303.20 hours, which included 306 hours on civil operations before the reorganization of the air services in July. (9) Service flying (instruction, refresher training, etc.) accounted for almost 90% (3787.55 hours) of the flying time. Aerial photography for the Geographical Section of the General Staff required 70.40 hours of flying during which 1870 square miles in Ontario were photographed for military survey mapping. Transportation flying amounted to 64.45 hours and miscellaneous 73.45.

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(9) The civil operations were 289.55 on forest patrol and 16.20 hours on preventive patrols (at Vancouver).

The Flying Training Station at Camp Borden (which became RCAF Station Camp Borden on 1 July 1927) was under the command of W/C N.R. Anderson until the beginning of August when S/L A.B. Shearer took over for four months. W/C G.M. Croil then became C.O. on 5 December 1927 and commanded the station for the next five years. At Vancouver S/L J.H. Tudhope relinquished command on 2 June 1927 and returned to Ottawa for duty with the Controller of Civil Aviation branch. As civil operations at the station had been suspended and the seaplane training course had been completed there was for a time little activity at Jericho Beach. P/O W.D. Van Vliet was in charge of the small staff until the end of September when F/L A.H. Hull was appointed commanding officer.

There were five casualties in the service during the year. P/Os C. M. Anderson and W.C. Weaver and AC1 J. T. Eardley were killed in flying accidents. F/L W.R.B. Annesley (RAF) and AC1 H. Dale died in Christie Street Hospital in Toronto from natural causes.

New construction

The search for a more suitable site to replace Camp Borden as the central training station was resumed and several potential locations were inspected. Meanwhile improvements were carried out at the camp, and at other bases used by the RCAF and CGAO. Rockcliffe was further developed for use as an aerodrome, in preparation for a transfer of flying operations from Shirley's Bay; the stop butts on the old rifle range were removed, the ground levelled, and action was taken to acquire more land for the station. On the depot at Victoria Island a new hangar was erected, and new quarters and other buildings were constructed at Shirley's Bay. In Manitoba a new building was erected for the wireless station on the Red River at Winnipeg, three new buildings were put up at Lac du Bonnet, five on the new site at Ladder Lake, and a mess building at Cormorant Lake. Development in Alberta included renovation of buildings at High River, the construction of a new landing-field at Rocky Mountain House, and four emergency landing-grounds in the patrol area. General improvements were carried out at Jericho Beach and on the east coast in the reopened station at Dartmouth a new concrete ramp was built and the stores building improved. The total expenditure by the Army Directorate of Engineer Services on construction and repair for the RCAF was $130,928. 78.

RCAMC services for the RCAF were expanded to keep pace with the growth of the force. (10) The radio systems operated by RCCS personnel between Ottawa and Camp Borden, and between the bases in Manitoba and Alberta were transferred in July 1927 to the CGAO Directorate. An RCCS detachment was also serving with the Hudson Strait Expedition to maintain air-to-ground wireless telephone and telegraph communication. Expansion of the radio system in the west was planned for 1928, to include six ground stations as well as 14 aircraft equipped with sets having a range of 125 miles for R/T and 200 miles for W/T.

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(10) A six-wheeled ambulance, the first of its kind in Canada, was purchased for use at Camp Borden.

D. Civil Government Air Operations 1927

The function of the new Directorate of Civil Government Air Operations under W/C Lindsay Gordon was "to administer and control all air operations carried out by state aircraft, other than those of a military nature, and to administer and control such units, formations, and detachments, etc., of the RCAF, as may be placed thereunder by instructions of the Honourable the Minister." When the division of RCAF units was made on 1 July 1927, the CGAO received the larger share, embracing the stations at High River, Winnipeg (with its sub-bases), Ottawa and Dartmouth, as well as No. 1 Depot and the Photographic Section at Ottawa. Service designations, such as No. 1 Wing and Nos 2, 3, 4 and 5 Squadrons, which had previously been used for the operational units, were now dropped and the old Air Board designation of "air station" was revived. Sixty officers and 214 airmen of the RCAF were detailed for duty with this directorate, their distribution, at 1 July 1927, being: (1)

	Officers	Airmen	Total
Headquarters	7	7	14
High River	5	25	30
Winnipeg	22	86	108
Ottawa	10	29	39
Dartmouth	3	11	14
Air Photo. Section	1	14	15
No. 1 Depot	6	30	36
Hudson Strait Exp.	6	12	18
Total	60	214	274

The Interdepartmental Committee on Civil Air Operations, which had been appointed the previous year, was also reorganized at this time. Col Biggar resigned as chairman in June 1927 and was replaced by the Deputy Minister of National Defence. The Department of the Interior was represented on the committee by the Director of the Dominion Forest Service, the Surveyor General and the Chief Aerial Surveys Engineer, while the Director of Civil Government Air Operations (W/C Gordon) and the Chief Aeronautical Engineer (W/C Stedman) became the air service representatives in lieu of G/C Scott and Mr Wilson. The committee continued to function as "a platform" for the discussion of all matters pertaining to air operations for the forest and survey services. Two other interdepartmental committees were also formed during the year, one to deal with the investigation of air mail services and the other with the Hudson Strait expedition.

The total flying on Civil Government Air Operations during 1927 was 3471 hours, representing a major increase of 1177 hours, or 51%, over the previous year. Almost all of the flying (3277 hours) was done for the Department of the Interior, with small amounts for the Department of Agriculture (65 hours), Post Office Department (59), Department of Indian Affairs (16), Public Works Department (8), and on the Hudson Strait Expedition (46). The two major civil government

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(1) There were, in addition, two officers (S/L Tudhope and F/L Cowley) who were detailed for CGAO and attached for duty to the Controller of Civil Aviation.

operations, which accounted for 3179 hours of all the flying, were on forestry patrol and topographical survey. Although forestry patrols had increased by more than 400 hours to a total of almost 1594, the most significant feature in the year's work was the great expansion of aerial photography for topographical survey and other purposes which now became the leading civil operation.

The total area photographed during 1927 was about 45,850 square miles, an area which, despite the increased amount of flying, was smaller than that covered in 1926 because more time was devoted to vertical photography and less to oblique. Oblique negatives, used for the general mapping of an area, averaged not quite two square miles in coverage, whereas vertical negatives, used for more precise, detailed mapping, averaged about one-fifth that coverage: only 16,000 negatives were exposed for 28,650 square miles of oblique photography, while 46,000 were exposed in vertical photography of 17,200 square miles.(2)

An interesting development during the year was the utilization of vertical photography for the investigation of water power development, water storage and similar engineering projects. It was demonstrated that the feasibility of a water power or stroage development could generally be ascertained by stereoscopic study of aerial photographs, often without doing any field work. In cases where field work was necessary a preliminary study of the photographs reduced it to a minimum and enabled the engineer to make a definite report after only a few careful measurements at critical points. This new application of aerial photography was of immeasurable value to engineers in Canada where hydro-electric developments were so often located in wooded country that was difficult to access. Aerial photographs were also being used for reconnoitring and laying out transmission and rail lines "with results that could be obtained in no other way in the same time and with the same expenditure."(3)

Almost 90% of the forest patrol work was done by the sub-bases of Winnipeg air station. A new sub-base was opened at Ladder Lake in Saskatchewan, extending the forest area patrolled by aircraft from the Ontario border across to the border of Alberta by Primrose Lake. High River contained its protection of the Bow River and Crowsnest reserves in the Alberta foothills, but wet weather reduced the fire hazard and, consequently, the amount of flying required. The total area covered by these patrols in the three prairie provinces was now 61,012,911 acres.

Innovations in civil work during the year included about 59 hours flying by Ottawa air station on the investigation of air mail routes for the Post Office Department, and 96 hours flying on dusting experiments for the Department of Agriculture.

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(2) These figures include 4,680 negatives taken under contract by Fairchild Surveys in the Ste. Anne district. In the four years 1924 to 1927 the RCAF had taken 163,000 photographs covering 199,220 square miles of terrain for use by the Topographical Survey Branch in correcting and extending the maps of Canada.
(3) Report on Civil Aviation, 1927; p. 89.

Crop and forest dusting (4)

Since 1921 the air services had been assisting the Department of Agriculture in its investigation of forest and crop diseases by exposing spore-trapping slides during routine flights. As early as 1923 the department had suggested that aerial dusting experiments also be carried out and designs for a hopper had been prepared by W/C Stedman for installation in a D.H.4 aircraft, but damage to the aircraft deferred the experiments. In 1924 Dr. J.M. Swaine, Chief of the Division of Forest Insects in the department's Entomological Branch, again raised the question of aerial dusting after a visit to the American experimental station at Tallulah, Louisiana. Because of the high cost of the experiment, involving the purchase of special aircraft and equipment, the RCAF was not prepared to undertake it at that time. When aerial operations for the 1927 season were being discussed, the Department of Agriculture once again proposed dusting experiments for the control of spruce budworm and cereal rust as "very important matters". The RCAF, after collecting information about the work that had been done in the United States since 1921, carefully considered the possibilities. G/C Scott, Director, RCAF, favoured having the experiments done under contract by a commercial company as being more economical, but General MacBrien, the Chief of Staff, was not in favour of letting a contract to an American firm and supported "the principle that, generally speaking, all experimental work should be carried out by the RCAF." (5) At a meeting of the Civil Operations Committee in March 1927 it was decided that the RCAF should proceed with the project. Two pilots, F/Os T.M. Shields and C.L. Bath, were sent to the Cotton Insect Investigation Laboratory at Tallulah for a one-week course in aerial dusting, and a contract was placed with the Keystone Aircraft Corporation at Bristol, Pa., for two Huff-Daland(6) aircraft of a type specially designed for dusting work. One aircraft was to be used for forest dusting in Nova Scotia, and the other for wheat dusting in Manitoba. When the aircraft were ready Bath and Shields went to Bristol to take delivery of them.

On 12 June F/O Bath, accompanied by Cpl A.E. Anderson, left Bristol on the floatplane "ZI" and reached Dartmouth the following day. The aircraft then proceeded to Whycocomagh on Cape Breton Island to carry out experiments under Dr. Swaine's supervision. Between 18 June and 27 July Bath flew 17.20 hours and spread 13,400 pounds of dust over the trees. Dr Swaine was well satisfied with the experiment. "The results (he wrote), so far as we can judge at the present moment, lead us to hope that we may be able to develop an effective means of control through airplane dusting and we have learned how to carry out such an

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(4) See A.F.H.Q. file 1008-17-2, vols. 1-3.

(5) MacBrien thought that "useful work of this kind will materially increase the support by the Public of the various activities of the RCAF."

(6) Originally known as the Huff-Daland, the type was called Keystone "Puffer" after October 1927. The price was $8,295 (FOB Bristol) for a landplane (less engine), and $10,395 for a single-float seaplane. The engines were Wright J 5s. The aircraft were fitted with hoppers of 600-pounds capacity.

experiment. This in itself indicates considerable progress for we surmounted many difficulties in this summer's work."(7)

Although Bath was commended as "a marvellously skilful pilot" who took a great interest in the work, he was much less enthusiastic about tree-dusting than was the scientist. With a single-engined aircraft the work was too dangerous as the pilot had to fly as low as possible over the tree-tops to distribute the dust evenly, and if anything happened to the engine the pilot had little chance of surviving a crash-landing in the trees. Furthermore, with a seaplane it took 30 to 60 minutes to reload the hopper with 600 pounds of dust, and only 90 seconds to spread it on the trees. In view of his remarks, W/C Gordon, the Director CGAO, suggested that it should be carefully considered whether the use of the "Puffer" for forest dusting was justified, and it was subsequently decided to investigate the purchase of a multi-engined aircraft both to increase the safety factor and to permit the dusting of areas remote from water bases.

The second "Puffer", which was intended for dusting operations over wheatfields in Manitoba, was not ready until 23 June when F/O Shields and AC 2 W.J. Boucher ferried it from Bristol to Winnipeg where "ZH" arrived on the 27th. Because wet weather delayed the development of the wheat rust fungus the experiments, under the direction of Dr. D.L. Bailey of the Botany Division, did not begin until 12 July. Three areas, each about 220 acres in extent, were selected in the Morden, Graysville and Portage la Prairie districts and were given two to five applications of sulphur dust. Despite adverse conditions - a very heavy epidemic of rust, unusually heavy rains, and late maturity of the wheat crop - the results were "distinctly encouraging." In one field the increase in yield and quality was estimated at $42 an acre, at a cost of $2.50 for 60 pounds of sulphur. Continuation of the experiments for one or two years more would be necessary "to give the method a fair trial and determine its practicability." (8) The whole experiment, the Dominion Botanist remarked, was "exceedingly instructive."

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(7) See report by Dr. Swaine, Associate Dominion Entomologist, published as Appendix A to Report on Civil Aviation, 1927; pp. 64-72.

(8) See paper on "Dusting with Sulphur for the Control of Leaf and Stem Rust of Wheat in Manitoba" by D.L.Bailey and F.J.Greaney published in "Scientific Agriculture", Vol. VIII, No. 7; March 1928: pp. 409-432; and Report on Civil Aviation, 1927; Appendix B (pp. 73-81).

High River

The station at High River, with an establishment of five officers and 27 airmen under the command of F/L R. Collis, was less active than in 1926, largely because of very unfavourable weather. The fire hazard in the forest reserves was low from April to August, and daily patrols were not necessary until as late as October; as a result the flying by the Avro aircraft decreased from 262 hours in 1926 to 193 in 1927. No fires were reported in the Bow River and Crowsnest reserves. (9)

The poor weather which reduced the fire hazard also retarded the photographic program that had been planned for the station. Nevertheless the amount of flying was increased from 108 hours in 1926 to 189 in 1927; and despite the handicap of the weather the photographs obtained were of much better quality than in previous years. During the flood period along the Highwood River, west of the air station, photographs were taken of the river banks for use by engineers in remedying the annual flood conditions in the area. On detached operations from the base, two D.H. 4 aircraft photographed areas totalling about 2230 square miles around Lacombe in Alberta and Melfort and Saskatoon in Saskatchewan.

On miscellaneous operations the station provided transportation for railroad officials and made some demonstration flights for the Edmonton Jubilee celebration in July.

P/O C.M. Anderson, a member of the original P/P/O course in 1923, was killed in a flying accident at High River on 28 June 1927 while engaged in formation flying practice on one of the "Siskins" on loan from the Air Ministry. Two weeks later another number of the 1923 course, P/O W.C. Weaver, lost his life in an accident in Manitoba.

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(9) It appears that Eckville was once again used as the northern refuelling base for the patrols in lieu of Rocky Mountain House that had been used in 1926. The forest reserves embraced 3,260,826 acres.

Winnipeg

Since the beginning of government flying operations in Manitoba in 1921 activities had increased year by year both in area and in scope. Originally operations had been limited to forest patrol but by 1927 so many other tasks had been assigned to the station that the staff of 19 officers and 81 airmen, under the command of S/L Johnson, was hard pressed to keep pace with the increasing demands. For operations in the 1927 season three new units were added to the station. In addition to headquarters, stores, workshops and winter base in Winnipeg, the station had four operational sub-bases at Lac du Bonnet, Norway House, Cormorant Lake, and Ladder Lake, a new site one mile east of Big River and 100 mile northwest of Prince Albert. Two mobile photographic flights were again sent out for operations in Manitoba and Saskatchewan, and two new detachments were formed, one on Snake Island in Lake Winnipegosis for forest patrol and the other at Winnipeg for wheat dusting experiments. Twenty-two aircraft, six "Vedettes", five "Vikings", five "Varunas", five Avro "Vipers", and a Keystone "Puffer", were used by these units. Each of the four summer bases had a "Varuna", a "Vedette" and an Avro; the two photo flights had a pair of "Vikings" each, one "Vedette" was stationed at Winnipegosis, and the dusting detachment had the "Puffer". The remaining aircraft, a "Vedette", a "Viking", a "Varuna" and an Avro, were held in reserve.

Flying time was increased by about 600 hours during the year to a total of 2028. Most of the increase was in the forestry work which rose by 50% from 886 hours in 1926 to 1344 hours in 1927. In other words this one task, protection of the forests in Manitoba and Saskatchewan, constituted two-thirds of the flying done by the Winnipeg units and about one-third of the total civil government flying at all stations. Photographic operations were also expanded from 483 hours in 1926 to 600 in 1927. On other assignments 58 hours were flown on crop dusting experiments and 26 hours on transportation and miscellaneous tasks.

Forestry patrol

Forestry patrols were carried out from the four bases at Lac du Bonnet, Norway House, Cormorant Lake and Ladder Lake, and the temporary base on Lake Winnipegosis. Of these Lac du Bonnet was the most active, flying 371.20 hours on patrol over the forest areas lying between the Manitoba-Ontario boundary and Lake Winnipeg as far north as Berens River. Norway House was responsible for the area bounded by the Manitoba-Ontario boundary, Berens River, the Grand Rapids line on the west, and the Hudson Bay Railway on the north; it logged 327.40 hours on forestry work. The northwestern area between Grand Rapids and Cedar Lake on the south and Deschambault and Kisseynew Lakes to the west and north was patrolled by aircraft from Cormorant Lake for 322.25 hours. This year a new patrol area was opened to extend the forestry protection further westward across Saskatchewan to Primrose Lake on the Alberta border: the northern limit of this area was the Churchill River and the southern a line through Big River. In its first year the new sub-base at Ladder Lake flew 293.20 hours on patrol over this area. A forestry detachment was also located for some weeks at Snake Island about five miles east of the settlement at Winnipegosis. After logging 29.40 hours on patrol over the forest around Lake Winnipegosis and as far east as Lake St. Martin, the detachment was transferred to Ladder Lake because of the low fire hazard in the Winnipegosis area. The combined extent of all these patrol areas was 57,752,085 acres. One hundred and six fires were detected during the 1344.25 hours on patrol.

In addition to their value in guarding the forest, aircraft were also of great value for survey to determine the extent, type and quality of the timber. In 1926 and 1927 some 24,000 square miles of forest between the Ontario boundary and Lake Winnipegosis were covered in "the most extensive combined aerial and ground forest survey attempted to date." Aircraft made a preliminary reconnaissance of the region to locate the forested areas which were then mapped from the oblique aerial photographs. Thanks to these maps and photographs the ground cruising parties of the Forest Service were able to avoid barren areas and thus reduce by about 75% the area which had to be covered on foot, with the further assurance that no stands of merchantable timber escaped observation.

> "The aerial survey not only saved a great deal of time in cruising but contributed greatly to the accuracy of the estimate of the amount of timber and in addition provided a map which will be most useful in the extraction of the timber, fire protection and administration of the area. The maps are already proving most useful in the exploration and development of the mineral resources and the photographs provide a permanent record from which further details can be obtained at any time." (10)

(10) Report of the Director of the Dominion Forest Survey quoted in Report on Civil Aviation, 1927; p. 49.

Aerial photography

For photographic operations two mobile, self-contained flights were once again in the field, each equipped with two "Viking" aircraft. Although designated as Manitoba and Saskatchewan flights, their activities were not restricted to the indicated provinces, but ranged from Rainy Lake and Kenora in Ontario to Wood Buffalo Park in northern Alberta. Unfavourable weather sharply curtailed the program that had been planned, only 600 hours - about 45% of the original proposal - being completed. The two flights set out in May, one on the 11th and the other nine days later, and both returned to base on 24 October after photographing 36,456 square miles in areas around Rainy Lake, Kenora, Winnipegosis, Flin Flon and Wood Buffalo Park.

The photographic operations were marred by an accident on 11 July, in which the crew of a "Viking" lost their lives. The aircraft, carrying P/O W.C. Weaver, AC 1 J.T. Eardley and Mr. F.H. Wrong, a Dominion Land Surveyor, was seen to break up in the air as it emerged in a dive from a layer of clouds near Hilbre, Man. Accident investigation and strength tests on another aircraft, carried out under the direction of W/C Stedman, indicated that the hull had failed near the pilot's cockpit and as a result the other aircraft of this type were strengthened by the addition of a wooden brace at this point.

In addition to crop dusting, described above, Winnipeg station provided transportation for the annual Indian treaty money payment party to points in the Norway House district, and continued spore-trapping work at Lac du Bonnet, Norway House and Cormorant Lake. The latter experiments supplied evidence of the marked effect that heavy rainfall had on clearing the atmosphere of rust spores.

Ottawa

Ottawa air station at Shirley's Bay, staffed by ten officers and 32 airmen, showed a great increase in flying activities. In 1926 the station logged 659 hours on service and civil work; in 1927 the total was almost doubled with 1247 hours, of which 867 were on photographic survey as compared with 332 in the previous year. Two detachments were employed on photographic operations. One detachment with two "Vedettes" was sent to Torrance in the Muskoka district, on 18 June, where it established a base at the southwest end of Bala Bay. It remained there for three months while the aircraft photographed about 3000 square miles of the Muskoka area. The detachment then flew north, on 17 September, to Sudbury where another base was established off the waterfront at the western end of Ramsay Lake. The operation order for this area was to photograph some 1700 square miles, but for over a month not one day was suitable for photography because of rain and overcast skies. Finally, in the last days of October, there was an improvement in the weather which permitted completion of the southern half of the area before the detachment returned to base on 2 November.

The second detachment, with a "Varuna" and a "Vedette", began operations at La Tuque in Quebec on 28 July, to photograph 154 square miles. The "Vedette" also made a flight from La Tuque to Baie St. Paul to carry out exploratory oblique photography across the unmapped area lying between the Batiscan River and Grand Lac Jacques Cartier. On completion of the work at La Tuque the detachment moved to Lake St. Joseph, about 20 miles west of Quebec, where a sub-base was opened on 14 September to photograph some 142 square miles in the Batiscan and St. Annes districts. The first area was completed in a fortnight by the RCAF aircraft; the second area (St. Annes) was done under contract by the Fairchild company. At the end of September the detachment moved again to Roberval where it remained until 1 November. During that time it carried out vertical and oblique photography over Chicoutimi, Jonquieres, Kenogami, Arvida, Bagotville, St. Alexis de la Grande Baie, the Saguenay River, Ha Ha Bay, the Peribonka River, the source of the Saguenay at Grande Décharge, around Lake St. John, up the Ashouapmouchan and Mistassini rivers, and along Lake Kenogami.

As mentioned previously, Ottawa air station flew 59 hours on investigation of air mail routes. Much of this work was on a series of ten experimental flights, carried out in September, October and November, between Montreal and Rimouski to accelerate the delivery of incoming and outgoing trans-Atlantic mails. It was on the first of these flights that the Vickers "Vanessa" was wrecked. On the morning of 9 September inbound mail was transferred from the "Empress of France" to a pilot boat off Father Point which then took the 32 bags to Rimouski where they were loaded on the "Vanessa", piloted by S/L Tudhope. As Tudhope was attempting to take off for the flight to Montreal the inner forward strut on the starboard float fractured, possibly due to a flaw in the material, and the seaplane keeled over to starboard. The mail was saved, but the aircraft capsized and broke up while being towed back to the wharf.

Subsequent flights by other aircraft showed that, owing to the lack of sheltered anchorages along the St. Lawrence, the service could not be flown with the necessary reliability by seaplanes. On the last two flights, therefore, a Fairchild monoplane was used, arrangements having been made for the use of suitable landing-fields at Rimouski and other points. The new air harbour at St. Hubert was used for the Montreal terminus. By using aircraft on the Montreal-Rimouski route the delivery of incoming mail was advanced by 30 hours on the average, and outgoing by 3½ days.

Ottawa air station also did some transportation work (including a flight to Montreal and return for the Governor General and Lady Willingdon), and spent 266 hours on instruction, practice and testing. Twelve aircraft were in use; in addition to four "Vedettes", two "Varunas" and three Avros, there were two new Fairchild monoplanes (used on the air mail route investigation) and a Douglas seaplane (tested on aerial photography). Facilities at Shirley's Bay had been improved by the addition of several buildings and a new hangar which increased the storage accommodation to eight aircraft. The station was open from 9 April to 7 December.

Dartmouth

Inactive in 1926, the air station at Dartmouth was reopened in 1927, under the command of F/L B.N. Harrop, and did over 202 hours flying. Over three-quarters of the flying (157 hours) was for photographic survey, the major task being vertical photography of 1940 square miles in the Shelburne area. A "Varuna" flying-boat was used on this operation from a temporary base opened at Shelburne on 4 June. Fog and low cloud greatly hampered work throughout the season, but 1728 square miles were completed before operations ceased. Some photography was also done in the Bridgewater area. Experiments in forest dusting to combat an outbreak of spruce budworm in Cape Breton Island were carried out by a Keystone "Puffer" attached to this station. Miscellaneous task included a search for a sunken vessel.

Vancouver

In the re-organization of the air services in July 1927 the air station at Vancouver was allotted to the RCAF and thereafter was employed primarily on service work. Earlier in the year, however, before the division was made, the base at Jericho Beach had made some flights with an HS2L to carry out an aerial photographic survey of swampy areas around Harrison Lake on behalf of the Department of Agriculture's study of mosquito control. Other civil operations formerly done at Vancouver, such as forest and fishery patrols, were now done by commercial companies under contract, Dominion Airways Limited undertaking forest patrol for the provincial government, and Western Canada Airways Limited doing fishery patrols for the federal government.

Hudson Strait Expedition (1927-1928)

When the government decided to complete the Hudson Bay Railway and its terminals, for use on the grain route to Europe, it was also decided to send an expedition into Hudson Strait to obtain accurate information about weather and ice conditions and to investigate the facilities necessary to ensure safe navigation. A special interdepartmental committee, consisting of representatives from the Departments of Marine and Fisheries, Railways and Canals, and National Defence, was set up in January 1927 to organize the expedition. (11)

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(11) P.C. 83 of 22 January 1927. Mr. N.B. McLean of the Department of Marine and Fisheries was chairman of the committee and officer in charge of the expedition. G/C Scott represented the Department of National Defence until 1 July when, on the reorganization of the Air Services, he was replaced by W/C Gordon.

Three objectives were outlined: to procure by air photography and reconnaissance definite information for the establishment of an absolute time limit for marine navigation through the strait; to test the feasibility of aircraft as an aid to navigation; and to test the suitability of air bases, aeronautical equipment and other equipment necessary to air operations, with a view to establishing operational air bases in the strait. To carry out the air operations of the expedition six Fokker monoplanes and a D.H. "Moth" seaplane were purchased, (12) and the RCAF provided a detachment of six officers and twelve airmen, under the command of S/L T.A. Lawrence, to fly and maintain the aircraft. (13)

The general plan prepared by the advisory board called for the establishment of three bases, at each end of Hudson Strait and at a point halfway between. The bases were to be established with prefabricated buildings, seven for each site, consisting of dwellings for officers and men, a radio house, a storehouse, a blubber-house and two hangars. The Fokkers, two to a base, were to be equipped with floats, skis and wheels, plus spare engines and all necessary accessories. Each base would also be supplied with a 30-foot motor launch, a skiff, a Fordson tractor, and radio equipment (including two gasoline engines to generate power, and two 150-foot steel mats), as well as gasoline, oil, coal, stoves, bedding, fire-arms, ammunition and a 16-months stock of provisions: "no essential was omitted." In addition to the 18 RCAF personnel (two officers and four airmen for each base) the expedition included an officer and three other ranks from the Royal Canadian Corps of Signals, three RCMP constables, and 19 civilians, making a total party of 44. Each base was to be manned by two RCAF officers and four airmen, a medical officer, a radio engineer, a wireless-operator, a Signals NCO, and RCMP constable, a storekeeper and a cook. (14)

Two vessels were used to transport the expedition. The CGS "Stanley", an ice-breaker, carried the personnel while the SS "Larch", a freighter, was loaded with 2700 tons of coal and 2585 tons of general cargo and carried a construction crew of 57 men. Sailing from Halifax on 17 July 1927, the two ships reached Port Burwell ten days later. There the "Moth" seaplane, which had been carried on the after deck of the "Stanley", was lowered over the side and S/L Lawrence accompanied by F/L A.A. Leitch made a flight to select a suitable site for the first base ("A"). Because ice made its first appearance at the western

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(12) The seven aircraft were not RCAF machines; they carried normal civil registration, G-CAHE to G-CAHJ for the Fokkers and G-CAHK for the "Moth".

(13) Personnel detailed for the expedition were given special refresher air and ground courses at Camp Borden early in 1927, and six air riggers were sent to the Atlantic Aircraft Corporation factory for familiarization training on the Fokker.

(14) The mixed service-civilian character of the staffs caused some lack of co-operation, particularly with respect to the responsibilities and authority of the officer-in-charge at the bases.

entrance to the strait, it was desirable to establish the bases in sequence from west to east and, after the first exploratory flights at Port Burwell, the expedition sailed on, leaving a detachment of four men, with a motor boat, equipment and two months' supplies, to continue the investigation of sites for Base "A".

Reaching Nottingham Island, at the western end of the strait, on 3 August, the expedition repeated the procedure, launching the "Moth" to select a suitable site, well sheltered and "the best available in such a rugged country", after which the equipment and supplies were landed and Base "B" was established. F/L Leitch was in charge of this base with F/O A.J. Ashton,F/S W. Ramsden, Sgt. W Keighley and Cpls D.B. Chambers and F.J. Ewart as the RCAF members of his staff.

Leaving the permanent party at Nottingham Island, the two ships turned eastward again, on 18 August, to lay down a third base at mid-strait. Extensive air patrols and ground reconnaissances around Lake Harbour on Baffin Island failed to locate a suitable beach, and the search then turned to the southern side of the strait where the expedition reached Wakeham Bay on 24 August. A short flight in the "Moth" quickly discovered a good location which was then surveyed on the ground, and the supplies were unloaded for Base "C". Two days later the little "Moth" was wrecked when a heavy gale blew up unexpectedly, churning up such heavy seas that within a few minutes it was impossible to approach the aircraft at its mooring. So violent was the storm that the two ships had to put out two anchors and keep their propellers turning to avoid dragging. For over twelve hours the "Moth" rode out the heavy seas - an amazing demonstration of its seaworthiness - before it finally capsized. During its brief life the seaplane had been of "invaluable" service for reconnaissance "as it would have taken the ships months of hazardous work" to survey the shores for suitable sites for bases.

When unloading operations were completed at Wakeham Bay on 11 September, the ships returned to Port Burwell, leaving behind at Base "C" a construction crew and the permanent party which included S/L Lawrence (officer in charge), F/O B.G. Carr-Harris, F/S. D. Black, Sgt. A. Caggie, and Cpls A.H. Warner and J.F. Riggs. After Base "A" had been established at Port Burwell with F/L F.S. Coghill, F/O A. Lewis, F.S. N.C. Terry, Sgt. H.C. Semple and Cpls. F.W. Kirkcaldy and H.W. Torrie as the RCAF personnel, the "Stanley" embarked the construction crews from the three sites and sailed southward on 11 November, leaving the permanent parties to complete the final details of the construction work before the severe cold weather set in. By the end of November all personnel, equipment and supplies were comfortably and safely housed.

For the first few weeks after the bases were laid down the personnel were very busy getting themselves established before winter set in. The weather was not good, fog in particular being a serious handicap as it occurred on an average of one day out of three during the last months of the year. The hills in the vicinity of the bases were totally obscured for days at a stretch. As a result, air operations did not begin until 30 September when Wakeham Bay made its first reconnaissance flights, followed by Nottingham Island on 11 October and Port Burwell eight days later. In the three months between the end of September

and the end of December 42 patrols were flown for a total of 45.50 hours. As the first ice did not appear near Nottingham Island until 16 November the objectives of the expedition were not affected by the limited amount of flying during these early months.

The initial schedule of air operations called for daily routine patrols from each base, weather permitting, to collect data on meteorological and ice conditions. These were supplemented whenever essential by special patrols. When it was desired to obtain data throughout the length of the strait within the same period of time, the patrol aircraft would rendezvous in certain areas between their respective bases to exchange information. Wireless communication from air to ground was maintained by a CT21 A transmitting set with trailing antenna. Both voice and key transmission could be used, a remote control being installed for the use of the pilot. While on patrol aircraft were required to communicate with base every five minutes. Visual observation of ice conditions was supplemented by oblique photographs taken by a hand-held camera, allowing a 60% overlap for stereoscopic interpretation. The exposures were pinpointed as accurately as possible on hydrographic survey charts on which a grid was superimposed.

The first patrols were flown with pontoons; when ice appeared in the strait in the latter part of November, skis replaced the pontoons on the Fokkers and remained in use until the spring break-up late in May. Pontoons were then again installed for the final weeks of operations. After the change-over to skis the program of daily patrols was continued, whenever possible, until 25 January 1928 when they were discontinued and replaced by fortnightly patrols as ice conditions had become "static" and there was no need for 24-hours surveillance. The schedule of fortnightly patrols remained in effect until 10 May when daily patrols were again instituted to watch for the spring break-up. Flying was done on every possible day and better weather permitted a higher percentage of patrols than at any other period. When the break-up came late in May the "between seasons" change from skis to pontoons made it necessary to suspend operations for periods of eleven days (at Wakeham Bay) to 40 days (at Port Burwell). Patrols were then resumed until 18 August when further air reconnaissance was unnecessary as the strait was free of ice.

Between the start of operations on 30 September 1927 and their termination on 18 August 1928 the three bases flew 227 patrols for a total of 369.44 hours and took 2285 photographs. Base "C" at Wakeham Bay was the most active of the three, logging 151.48 hours on 98 patrols. It was the first to begin operations, making the initial reconnaissance on 30 September, but like the other bases its early activities were severely restricted by bad weather. In the 53 days between the start of patrols and the freeze-up in November, patrols were possible on only ten days; snow and fog prevented flying on 24 days and on 19 other days the aircraft were grounded because of high winds and heavy formations of shore ice. After an 18-day interval between pontoons and skis,

patrols were resumed on 12 December and continued until 18 June when the break-up of the ice forced a suspension until 30 June when it was possible to use pontoons again. Flying ceased on 18 August.

Base "B" at Nottingham Island carried out 82 patrols for 134.10 hours of flying. Beginning operations on 11 October, it carried out patrols whenever the generally bad weather permitted and reported the first appearance of ice in the strait on 16 November. The cove on which the base was located froze over that day, stopping operations on pontoons. As it was much colder at Nottingham Island than at the other bases, the "between season" period lasted only seven days and on 23 November patrols were resumed on skis, continuing until 30 May when the break-up occurred. Pontoons then replaced the skis and operations continued from 2 July until 15 August.

Port Burwell (Base "A") suffered the worst weather conditions of the three and was able to carry out only 47 patrols for 83.46 hours; it was further handicapped by the loss of one of its Fokkers. After flying its first patrol on 23 October, the base had a period of 31 days on pontoons before the ice formed. The weather, however, was very bad with almost continuous high winds, snow and limited visibility. When it was necessary to change over from pontoons to skis, unsafe ice conditions along the shores and in the cove presented great problems and entailed endless labour. Every tide undid the efforts of the personnel to construct a runway from the hangars over the rough shore ice to the level ice in the cove. As a result 19 days elapsed before it was possible to resume operations on skis on 13 December. There was another, longer interruption in the spring when the ice broke up. The use of skis had to stop on 22 May, and it was 2 July before the Fokker could resume work on pontoons. The last patrol was flown on 6 August.

Wireless communication facilities for the expedition were installed and operated by a party of RCCS personnel led by Capt. Laurie. Each of the three bases was equipped with a standard SITD2 receiver set, and the Fokker aircraft carried the new CT 21 transmitter which had a range of approximately 100 miles for voice and up to 500 miles for telegraph. Nottingham Island, the western base, was often able to read signals from aircraft operating out of the eastern base at Port Burwell. During the winter months the pilots preferred to use the wireless key rather than voice transmission because of the inconvenience of handling a microphone while wearing face masks and heavy mitts. On 175 flights on which wireless was used there were only three cases of failure. On occasions when aircraft had to land away from base, the pilot was able to report the cause and the approximate location before coming down.

Despite the severe conditions under which aircraft, crews and ground personnel had to operate, activities were never interrupted by mechanical failure and there were only three forced landings, one at each base, due to weather conditions. All three fortunately had happy endings. On a return flight

from Erik Cove at Cape Wolstenholme to his base at Nottingham Island on 15 December, F/L Leitch encountered a heavy snowstorm halfway across the strait. After flying for some time he concluded that he had overshot the base in the poor visibility and landed on an ice floe to await clearer weather. During the night the temperature fell to 16 degrees below zero and the crew of the Fokker suffered a few minor frost bites. The next morning Leitch took off again from the ice floe and set course northeastward until he made landfall at the extreme northwest corner of Nottingham Island whence he followed the coast line back to base, landing with about one quart of petrol in the tanks.

The next incident, which befell S/L Lawrence on 8 January, was much more protracted. On a patrol from Wakeham Bay to Nottingham Island the aircraft met such a severe snowstorm 20 miles east of Cape Digges that the pilot turned back to Sugluk Inlet and then, like Leitch, decided to land to await better conditions. The next day, when the weather showed no improvement, the crew attempted to return to base, only to be forced down again by snowstorms at Deception Bay. Here they were marooned for nine days "during which time typical Arctic storms prevailed." On the eighth day a search aircraft from Wakeham Bay, piloted by F/O Carr-Harris, found the missing Fokker and its crew, and the two aircraft returned to base together on the 17th.

A month after Lawrence's safe return, a third crew was reported missing from Base "A" and for almost a fortnight grave concern was felt for their safety. On 17 February F/O Lewis, with his mechanic F/S Terry and an Eskimo guide "Bobby", (15) left Port Burwell to make a patrol northward to Resolution Island and thence to Grinnell Glacier on Baffin Land. On the return flight the crew became lost in heavy snowstorms and flew eastward, passing over the mainland of Labrador without seeing the ground obscured in the swirling blanket of white.

Through his wireless set Lewis had been in touch with base ever since take-off and was able to report his plight although he could not give his location, nor receive any message from the base. At 1443, when the Fokker had been airborne almost four hours, Port Burwell received a message: "Believe I see land; be unlucky if it isn't, because our petrol is nearly gone." A quarter of an hour later another message was picked up: "Cannot see land...don't know where we are." The wireless log closed at 1510 with the final message: "Landing on ice in middle Ungava." The estimated position was incorrect; the Fokker had actually come down on the rough, hummocky floe ice of the Atlantic Ocean, far to the east of Ungava Bay. In the mistaken belief that they were in Ungava Bay, however, the three men took their emergency kit and set out to walk back to base.

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(15) An Eskimo was normally included in the crew of three to be a helper, and also a hunter and guide in case of forced landing.

For a full day they marched eastward across the ice before they finally realized their error and turned about. The going was arduous in the extreme. The ice conditions were very rough. Seemingly endless lanes of open water had to be crossed on the inflatable rubber air raft that they carried. The fuelfor the primus stove was used up; the food in their emergency kit also was consumed after a few days and the three men then had to live on raw meat from walruses which their native companion shot. After seven days of hard travelling and much privation, they reached the coast of Labrador and walked north along it for four days. The land was totally barren with no sign of any life, human, animal or bird. The men continued to suffer greatly from cold, hunger and exposure. On the fifth day after reaching the coast they came upon an Eskimo hunter and his wife who gave them food ("of a kind") and provided a dog team on which they were carried back to Port Burwell after an absence of 13 days. During the time that they were missing, aircraft from the three bases had been standing by to search for the men, but this was the coldest and stormiest period of the winter and on only three of the 13 days was it possible to do any flying. (16)

The original plan of the expedition was that the aircraft would return by air to Ottawa after operations ended along Hudson Strait and, with the assistance of the Hudson's Bay Company and Northern Aerial Minerals Exploration, the necessary fuel caches were laid down at points along the east coast of Hudson Bay. Late in August the five Fokkers rendez-voused at Erik Cove on Cape Wolstenholme for the southward flight, but extremely bad weather again set in and when an attempt was made to get away on the 29th only three of the aircraft became airborne. One was unable to start because of engine trouble, and another crashed when a pontoon was torn away. Considering the weather-beaten condition of the remaining aircraft, S/L Lawrence decided it was unwise to continue with the projected flight, and radio signals recalled the vessels which had come to embark the other members of the expedition and their equipment from the three bases. After dismantling and loading the five aircraft, the expedition ships returned to Halifax and Quebec in October and November 1928. (17)

In his report on the flying operations S/L Lawrence pointed out that magnetic compasses were "very erratic at any time" and in some localities "it was utterly impossible and unsafe to attempt to navigate by them." (18) The existing maps

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(16) By his boastful attitude and insubordination after this incident, Eskimo "Bobby" incurred some official displeasure. He apparently was promised a boat as reward for his services in helping his two companions, but the matter seems to have been overlooked after the expedition's return, until almost 20 years later some inquiries reopened the matter.

(17) The story of the expedition, complete with meteorological data and photographs is given in a report by Mr. N. B. McLean, published by the King's Printer in 1929 (pp. 221). S/L Lawrence also prepared a typescript report for the Director of Civil Government Air Operations. (He was promoted to temporary squadron leader rank while on the expedition, reverting to flight lieutenant after his return.)

(18) Four types of compasses were supplied - Earth Inductor, Magnetic, Sun and Aperiodic; only the last proved satisfactory. When used with the turn and bank indicator ("a very valuable instrument") the Aperiodic compass "could be relied on with safety."

were also very inaccurate, it being impossible to identify some parts of the coastline by comparison with the maps; there were countless uncharted or incorrectly located islands, and the contour of the land was poorly shown. "All of these features made aerial navigation somewhat difficult, and especially in the winter when on occasions it was almost impossible to recognize landmarks or tell land from ice when covered with snow." So inaccurate were the charts of the strait that S/L Lawrence believed that they presented "a large and dangerous factor in the development of the strait as a commercial water route", and he recommended aerial vertical photography be done to prepare new charts. He also thought that the presence of at least one aircraft somewhere in the strait at all times would be most useful as an aid to marine navigation by passing information about ice conditions. After a few early experiments no problems were encountered in starting the aircraft engines in cold weather. No heated storage was available, but artificial heating by blow torches and an asbestos cover was used when the temperature fell below freezing. This process took 30 to 40 minutes; when the engine was warm and supple warm oil was put in the tanks, the asbestos bag removed and the engine primed and started. The engines (Wright "Whirlwind" J4B and J5C) "functioned perfectly" even under temperatures as low as - 56 degrees at 10,000 feet altitude.

Emergency rations carried on flights consisted of 12 lbs. of bully beef, 15 lbs of hardtack, 8 lbs. of bacon, 6 lbs. of pork and beans, 3 lbs of chocolate and 1 lb. of tea, which it was estimated would sustain three men for at least ten days. Other emergency equipment included a primus stove and coal oil, an engine tool kit, lubricating oil, a rubber raft, distress signals, rifle and ammunition, Arctic sleeping bags, rope, axe and knife, plus seasonal equipment such as engine cover, anchor, bilge pump, and silk tent for the summer months or asbestos bag, blow torches, ice picks and snow knife for the winter months.

In planning the equipment for the bases, it was recommended that each should have a small library. The "powers that be" did not approve, but the Department of National Defence undertook to supply the books and they were much appreciated. S/L Lawrence subsequently recommended that no expedition should be sent to isolated areas without a small but comprehensive library. He also suggested that at such sites many small buildings were preferable to a few large ones, for safety in case of fire and for greater privacy for the personnel, as well as ease of construction and heating. For pastime it is interesting to note that some members of the expedition took along their golf clubs and played the game on the ice, using dark-coloured balls. This was probably a far north record for that ancient game.

E. Aeronautical Engineering Division

The function assigned to the Aeronautical Engineering Division in the reorganization of July 1927 was "to act in a consultant capacity respecting all technical and engineering matters pertaining to the Air Services, and the carrying out of duties prescribed by the Air Board Act and Regulations thereunder." W/C Stedman, the Chief Aeronautical Engineer, was under "civil control" in so far as his function was concerned, being directly responsible to the Deputy Minister. His branch had a strength of five officers and 12 airmen, including two officers and five airmen who were on the staff of No. 1 Depot. The branch was subdivided into sections for research and design, airworthiness, and aircraft inspection. In addition to its work for the other three branches of the government air service, the AED was available for consultation by all organizations operating aircraft in the Dominion.

During the year, three of the new Vickers designs were completed and test trials began. The little "Vigil" promised to be "a very successful type", but the large "Vanessa" cabin biplane was a failure. Completed during the summer of 1927, the aircraft was wrecked during its initial trials when a strut fitting failed. (1) The "Vista" was not ready until late in the fall when the freeze-up of lakes and rivers prevented a full series of test flights. Construction of the large photographic "Velos" had been delayed to permit modification of the design. The front portion of the fuselage was enclosed to give better operating conditions for the crew and, to improve the performance, two "Wasp" engines were installed in lieu of the "Lynx" of "Whirlwind" radials that had originally been proposed.

While these experimental types were being developed, production of the "Viking", "Vedette" and "Varuna" continued, and some Avro trainers were reconditioned. The RCAF accepted five "Viking" hulls, seven "Vedettes" and three "Varunas", as well as twelve Avros.

One of the most interesting research projects in 1927 was a series of flights to test a variable pitch propeller which had been designed and developed by W.R. Turnbull of Rothesay, N.B. One of the great pioneers of aeronautical research in Canada, Turnbull had produced and ground-tested his controllable pitch propeller as early as 1923. Unfortunately the first propeller was destroyed in a fire and air tests of the invention were delayed until the spring of 1927 when a new propeller was brought to Camp Borden and fitted to an Avro 504K. Among the pilots who test flew the propeller during May, June and July of that year was F/L G.E. Brookes, one of the flying instructors at the station. After successful demonstration of his invention by the RCAF Turnbull sold the patent rights to the Curtiss-Wright Company which subsequently developed its electric propeller from Turnbull's original designs.(2)

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(1) According to the "official" explanation given in the Report on Civil Aviation, 1927; p. 62. In his memoirs A/V M Stedman says the "Vanessa" was lost on a air mail flight between Rimouski and Montreal, by being wrecked in heavy seas.

(2) See Dr. J. J. Green's paper "The Growth of Aeronautical Research in Canada During the Post-War Decade", published in the Journal of the Royal Aeronautical Society, December 1955; p. 792. The original Turnbull propeller, used in the flight tests at Camp Borden,

Chapter XII

A. Parliament 1928

When the Governor General opened the second session of the Sixteenth Parliament on 26 January 1928, he referred to the progress that had been made in the development of aviation in the Dominion; an organization had been established for the administration of civil aviation, distinct from that of the air force; the site for an airship base had been purchased near Montreal to assist in the development of transoceanic air routes, and an air mail service had been inaugurated between Rimouski and Montreal.(1)

The members had no objection to the opening of a public air terminal or air mail routes, but some were not entirely satisfied with the new organization for the separation of civil and military aviation. Protests were made, by Miss Agnes Macphail among others, that the government had notkept its promise; civil aviation should be completely divorced from national defence and military personalities and placed either under another department (railways and canals, or marine and fisheries), or, as Miss Macphail recommended, under a new department of transportation that would include aviation, railways, canals and highways.(2)

Later in the session Miss Macphail proposed the establishment of yet another department for the promotion of peace and international understanding. In the debate on her motion, Prime Minister King said that the promotion of peace was not a task for one department, but for every department, for the government as a whole and for parliament as a whole: "it is a part of the supreme duty for all". With reference to Canada's defence forces he pointed out that the 1928 estimates for the militia and the navy were the equivalent of those presented in the period prior to 1914; only the air services estimate was higher than in previous years. In defence of the increase for that branch he asked:

> "Will anyone in this house suggest, having the knowledge we all have of the development of aerial navigation and the possibilities of aerial attack and aerial defence, that it is not wholly essential that this country, in common with all other countries of the world, should develop an air force? Is there anyone....who does not feel that the air force is likely to play a part second to none in the future? I believe that this parliament will say that a country like Canada, with the vast distances which we have here to traverse, and incidentally to defend in case of attack at any time, is justified both for military and civil reasons in paying very special attention to the development of air forces and aerial navigation and that the addition which parliament is being asked to vote inthat connection will be voted with good grace."(3)

As Mr. King had hoped, the air estimates when they were presented were passed "with good grace" and very little discussion. Once again, as in the previous year, there were two

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(1) Hansard, 1928 Session; Vol. I, p. 2.
(2) Ibid.; Vol. I, pp. 140, 211-2.
(3) Ibid.; Vol. II, pp. 1709-10.

votes, one of $1,697,694 for the RCAF and another for $3,345,037 for civil air operations (including CGAO, CCA and AED).(4) The total sum, $5,042,731, was an increase of more than $1,150,000 over the previous year, but almost the whole increase - more than $1,000,000 - went to civil air operations which now received twice as much money as the RCAF.

When a member (Mr. J.S. Woodsworth) again raised the question why it was necessary to include the civil air force under the Department of National Defence, Mr. Ralston, the Defence Minister sketched the steps leading up to the reorganization in July 1927,(5) which made "a straight division" between military and civil government operations. Although most of the personnel in the civil branch were still in the air force," we are making the transition as fast as we can in an endeavour to establish a purely civilian organization." The Controller of Civil Aviation branch was already under the Civil Service Commission, and its positions were being filled entirely by civilian personnel.(6)

When parliament prorogued on 11 June 1928 the Governor General again referred to developments in civil aviation in the offer of government assistance to civil flying clubs and the construction of the airship mooring tower at St. Hubert.(7)

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(4) The original votes were $1,669,694 for the RCAF and $3,195,037 for civil air operations (total $4,864,731), which were subsequently increased to the amounts shown above. The civil vote was subdivided into $2,378,196 for CGAO, $874,600 for CCA, and $92,241 for AED. The RCAF vote included "training of personnel for civil air operations" as well as maintenance and training of the RCAF.

(5) His statement that "at their inception (the air services in Canada) had to do particularly with military air service" was not quite accurate.

(6) Hansard, 1928 Session; Vol. III, pp. 3765-6 (service vote) and 3777-8 (civil vote).

(7) Ibid.; Vol. III, p. 4176.

B. Royal Canadian Air Force 1928

Early in 1928 G/C Scott relinquished the post of Director of the RCAF which he had held for the past four years, and was placed on the Reserve of Officers. W/C L.S. Breadner, who had been Assistant Director for Air Staff Duties, became Acting Director on 15 February 1928, retaining that appointment until the spring of 1932; he continued to act as Assistant Director also until the end of 1929. W/C G.M. Croil was in command of the RCAF station at Camp Borden and F/L A.H. Hull headed the other station at Vancouver.

At Camp Borden there was an expansion of all phases of training. The P/P/O scheme drew the largest number of trainees since its inception five years previously, with a total of 62 RMC and university cadets in attendance. The first term intake was exceptionally large, numbering 43, but the wastage was high, 11 failing to complete the first term. Twenty-one members of the course eventually qualified for their wings, the graduates including a future CAS, H.L. Campbell, as well as several other officers who rose to air rank, J.G. Kerr, W.E. Bennett, J.L. Hurley and H.H.C. Rutledge.(1) The second term numbered eleven, all of whom were successful in their examinations, and the third term had eight pupils. P/P/O R.B. Brown was killed at Wasaga Beach on 26 July 1928 in a flying accident on an Avro 504N. The other seven third-term trainees passed the tests for the pilot's flying badge on 17 August, P/P/O W.G. Brown winning the Sword of Honour for his course. Among the other graduates who subsequently served with the RCAF were R.C. Gordon, E.A. McGowan, E.A. McNab, and V.H. Patriarche.

The second airmen pilots' course was completed at Camp Borden early in 1928 with four airmen, Sgts. R.F. Gibb, G.T. Elliott, H.J. Winny, and R.I. Barton, receiving their wings. A third course was started in October to run until the beginning of March 1929. Thirteen airmen were detailed for the course and nine graduated. Cpl. J.G. Ault, one member of this course, was killed in a flying accident on 5 February 1929 when his Avro 504N stalled on a turn.

The technical training scheme for boys drew 22 pupils for its second year; all were successful in their examinations. It was intended to increase the number of boys in future years "to make available a supply of well trained air mechanics for civil aviation."

Other training courses at Camp Borden included the usual parachute course (19 officers and airmen), and refresher flying training (35 pilots), chiefly for Non-Permanent officers who were being taken into the air force for civil government air operations. Once again a flying instructors course was given to qualify officers, 15 in number for this year, for the service's expanding training requirements. Flying training courses were also conducted for civilian pilots; in addition to eight commercial pilots who were given advanced training, 32 civilian pilots were given a flying instructors course to staff the new

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(1) Two members of the course got their wings in the fall of 1929 after taking an extended second term; the other 19 graduated on 27 August 1930. Three of the graduates subsequently joined the RAF.

flying clubs that were springing up with government assistance.

The de Havilland "Cirrus" Moth was now beginning to supplant the veteran Avro 504 as the basic trainer in the RCAF. F/O A.E. Reynolds was killed in a flying accident at Camp Borden on 1 November 1928 while making a test flight on one of the new aircraft.(2)

At Vancouver where seaplane training was the primary activity, ab initio courses were given for 66 officers and airmen. The courses lasted four to six weeks at the end of which the pilots were usually posted to one of the "civil" bases to begin operational flying. Avro floatplanes were used for training.

Seven combined exercises were carried out with the other services for a total of 126 hours flying. They included one long naval co-operation exercise with HMCS "Vancouver" on the Pacific coast.

Photographic operations for the Geographical Section, General Staff, covered 1240 square miles, chiefly in the Lindsay, Scugog, Rice Lake and Port Hope areas of Ontario with smaller areas in the Disraeli and Valcartier sectors of Quebec. These operations required 135 hours' flying, in addition to which the RCAF flew 124 hours on transportation and 154 hours on miscellaneous tasks. The total flying during the fiscal year was 6793.45 hours, an increase of more than 50% over the previous year; over 90% of the total was classified as service flying, including instruction.

Eight officers were attending courses abroad in the United Kimgdom and three others were on exchange to the RAF.

During the year the RCAF increased its strength by 150, rising to a total of 131 officers and 590 airmen at 31 March 1929.(3) About one-half of the total strength was attached for duty with the "non-military" branches of the air service, the CGAO, AED and CCA divisions. Distribution of personnel at 31 March 1929 was: Ottawa 297, Camp Borden 261, Winnipeg 113, High River 26, Vancouver 22, and Montreal (AID) 2.(4)

Seventy-four Army personnel were also attached to the RCAF and paid from RCAF funds. Many of these were employed on operation of the radio systems in Alberta, Saskatchewan and Manitoba, High River, Ladder Lake, Prince Albert, Ile-à-la-Crosse, Lac la Ronge, Waskesiu, Winnipeg, Lac du Bonnet, Norway House, Cormorant Lake and Winnipegosis, as well as the stations at Ottawa and Camp Borden. A station had been opened at St. Hubert for the air mail service; a detachment was also with the Hudson Strait Expedition through the first eight months of the year to maintain communications between the bases and Ottawa.

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(2) In addition to the fatalities in flying accidents, four airmen - AC1 W.F.P. Drolet and AC2s A.W. Grimmer, J.O. Chambers and C.J. Mills - died during the year from natural causes or drowning.

(3) The officer strength included 46 Non-Permanent officers who were on continuous service with the RCAF.

(4) Unfortunately, from these figures of location it is not possible to make a break-down by branch of the air services.

In addition to the operation of the radio systems the RCCS had continued its experimental work and, in conjunction with the Northern Electric Company, had developed an intercommunication set for use in aircraft to link the pilot and his observer or passenger. Such equipment was particularly desirable in aerial photographic operations to eliminate the old speaking-tube or awkward hand signals.

Construction

There was a sharp rise in the volume of construction work undertaken by the Army Directorate of Engineer Services for the RCAF. In the fiscal year 1927-1928 the expenditure had been $130,928.78; in the following year the sum was more than trebled, rising to $415,635.60. Over two-thirds of this amount was on the further development of Rockcliffe to drain, grade and surface the aerodrome, construct roads, erect a new concrete hangar, and lay in water supply and electric power. Work at Camp Borden cost almost $45,000, although expenditures there were kept to a minimum as plans for selection of a new site were still under consideration: "it is essential that the units occupying this station be moved to a more suitable point". Another major construction item was the Stores Depot at Victoria Island in Ottawa. Some improvements were made at Shirley's Bay, Bessonneau hangars were erected and sheathed at Lac du Bonnet and Cormorant Lake, and land was purchased for the expansion of St. Hubert, Rockcliffe and Lac du Bonnet.

New aircraft

One of the most significant developments of the year was the acquisition of new types of training and service aircraft. Reference has already been made to the appearance of the D.H.60 "Moth" as replacement for the Avro trainer which had done yeoman service for many years. Even more significant was the purchase of some military types to form a fighter and an army co-operation flight at Camp Borden. Early in 1926 two Armstrong-Whitworth "Siskin" single-seater fighters had been sent out to Canada by the Air Ministry for winter flying tests. Subsequently the RCAF ordered nine "Siskins," four for delivery in 1928 and the remainder in 1929. At the same time six Armstrong-Whitworth "Atlas" two-seater army co-operation aircraft were purchased in the United Kingdom. As the service types - SE5s, Bristol Fighters, DH4s, DH9s, and F3s - received in the British government's gift of 1919 had been withdrawn from use, the RCAF was, in the military sense, unarmed until the "Siskin" and "Atlas" were brought into use. Their acquisition, however, proved to be a unique step rather than the beginning of the development of a military air force. For the next few years the RCAF was employed "principally as a training ground for civilian work" and no more military aircraft were purchased until 1934.

C. Civil Government Air Operations 1928

With an appropriation of $2,378,196 for the fiscal year (an increase of more than $460,000, or about 25%, over the previous year) the CGAO Directorate was able to expand its operations in every field. More than 9000 hours were flown, an increase of about 5500 hours from the 1927 total. Forestry patrols were more than doubled (3200 hours), and photographic operations, including reconnaissance, rose in about the same ratio to 3538 hours. Air mail and air route investigation, transportation and other types of flying also showed marked increases.

In the past, photographic operations had been carried out by self-contained detachments from the air stations at High River, Winnipeg, and Ottawa. In 1928, the detachments, eight in number, were set up as separate units under the control of CGAO headquarters in Ottawa for their operations across Canada from coast to coast. In addition to these detachments the directorate included the four air stations at High River, Winnipeg, Ottawa and Dartmouth,(1) No. 1 Depot and the Photographic Section at Ottawa, and the RCAF party in the Hudson Strait Expedition.

Several new types of aircraft made their debut in civil operations in 1928, including the DH60 "Moth" used for forest patrol, and the Fairchild FC2 used for photography and air mail investigation. The civil government fleet included 61 aircraft, with Fairchilds, "Moths" and "Vedettes" making up four-fifths of the total. The distribution by types was:

Type	High River	Winnipeg	Ottawa	Photo Dets.	Total
DH 60 "Moth"	6	7	3		16
Douglas			1		1
Fairchild (2)		4	3	10	17
Keystone "Puffer"		1	1		2
Vickers "Varuna"		4	1		5
Vickers "Vedette"		8	3	4	15
Vickers "Viking"		2		2	4
Vickers "Vista"			1		1
Total	6	26	13	16	61

Photographic survey

During the year 88,000 photographs were taken on an extensive program of aerial survey which covered 65,200 square miles, an increase of more than 40% over the previous season. Most of the work was on vertical photography, 70,500 negatives being exposed

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(1) Only a **nucleus** staff was maintained at Dartmouth to assist the photographic detachment operating in the Maritimes. Although Vancouver was not a CGAO station, it did make a few customs patrols as in earlier years.

(2) There were two types of the Fairchild, the FC2 with the 200 hp Wright "Whirlwind" engine, and the FC2W with the more powerful 425 hp Pratt and Whitney "Wasp".

to record 31,400 square miles, while 17,500 oblique negatives covered 33,800 square miles. Eight self-contained detachments were in the field, each equipped with two aircraft(3) and, in most cases, a staff of two officers, four airmen and a Dominion Land Surveyor to act as navigator. The detachments flew 2816 hours on 54 operations, chiefly in Quebec, northern Ontario and Manitoba.

No. 1 PD, based on High River, worked in British Columbia, principally in the area around Sicamous and along the Fraser and Thompson rivers.(4) Nos. 2, 3 and 4 PDs, detached from Winnipeg air station, ranged over northwestern Ontario, Manitoba and northern Saskatchewan and Alberta. They photographed flood areas around Lac Seul, Quetico, Rainy River and Kenora in Ontario, power sites along the Nelson River, mining areas between Goose Lake and Kississing in Manitoba, areas around Lac la Ronge and Reindeer Lake in Saskatchewan, and the northeastern corner of Alberta between Slave River and Lake Athabaska. In addition to these major tasks and many smaller ones, the detachments provided communication between widely separated ground survey parties, and reconnoitred the Buffalo Park Reserve west of Fort Fitzgerald in northern Alberta. The reconnaissance showed that there appeared to be no landing places in the whole territory west of the Slave River and, to avoid undue risk to personnel, the Topographical Survey Branch cancelled the photographic operation which had been proposed for this area.

Nos. 5, 6 and 7 Photo Detachments, working out of Ottawa, carried out 20 assignments in eastern Ontario and western Quebec. The largest task, in which Nos. 5 and 7 co-operated from a base on Lac Archambault, was to photograph an area of some 3500 square miles lying between Lake Cypress and the Mastigouche River on the south and Lake Mondonak and the Vermilion River on the north, covering the headwaters of the Gatineau, Rouge and Mattawin Rivers. To the west, in Ontario, more photography was done around Sudbury and Lake Nipissing, and along the Ottawa River to Montreal. Another operation was completed around Rouyn in western Quebec, and a smaller task near Lake Batiscan, east of the St. Maurice River. These detachments also carried out numerous special flights to photograph smaller areas.(5)

In the maritimes No. 8 PD, based on Dartmouth, did assignments around Shelburne and Cape Breton in Nova Scotia, Saint John and the Petitcodiac River in New Brunswick, as well as covering two map sheets of the topographical survey.

Ottawa air station also did some photographic work, chiefly to train personnel for these operations, and covered about 1200 square miles in 139 hours of flying.

The Photographic Section in Ottawa processed 1,002 rolls of film sent in by the photographic units; the total for the previous year had been 645 rolls. From the 88,000 negatives it

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(3) Five detachments had Fairchilds, two flew "Vedettes", and the eighth had "Vikings".
(4) This detachment also flew four hours on customs patrols along the British Columbia coast.
(5) Fairchild Aviation Limited of Grand Mere also did vertical photography in Quebec under contract from the federal government, and provided 4015 photographs for topographical mapping.

produced 180,000 prints for the use of the Topographical Surveys Branch, and an additional 18,000 miscellaneous prints for commercial concerns and private individuals. The staff of the section consisted of two officers and 18 airmen (seven of whom were untrained) with the addition of seven civilian employees during the busy season. From Elgin Cottage the section had moved in May 1928 to new quarters on the eighth floor of the Jackson Building in Ottawa where it remained until a special building was completed for it at Rockcliffe in January 1936.

Oblique photographs were used to prepare maps on a four-mile-to-the-inch scale for the National Topographic series. Each map sheet on this scale covered one degree in latitude and two degrees in longitude, representing an area of about 6,000 square miles. The general procedure was to photograph the area obliquely from an altitude of 5000 feet, using a Fairchild camera fitted with a wide-angle lens. Parallel flight lines were laid out, spaced six miles apart, and groups of photographs were taken at timed intervals, ahead and to the right and left. Photographs were also taken along other flight lines laid out at right angles to the first strips.

For more detailed mapping vertical photography was used, the negatives, 7 by 9 inches in size, usually being exposed at 10,000 feet, using a lens with 8-inch focal length. From these photographs, maps were compiled on a two-mile-to-the-inch scale, each sheet covering one-half degree in latitude and one degree in longitude, or an area of approximately 1500 square miles. Vertical photographs were also used for other purposes such as to construct mosaics of important areas, to investigate prospective power developments, water storage reservoirs and other engineering problems, and to assist in surveying for minerals.

Dusting experiments

Following the initial experiments with the two "Puffers" in 1927, the Department of Agriculture requested a continuation of wheat and tree dusting trials in 1928. With the "Puffer" landplane F/O Shields made a series of flights, totalling 40 hours, to spread dust on wheat fields in Manitoba. The rust epidemic was light that year, however, due to the rapid ripening of the grain and the experiments did not produce any significant results.(6)

Forest dusting with the "Puffer" floatplane was started in June in the Westree area west of Sudbury, but continual rain and bad weather so hampered the work that only 10 hours of actual dusting were possible in the fortnight before activities were suspended because the appropriate season had passed. Although the desired results had not been obtained Dr. Swaine thought that definite progress had been made and, if it had not been for the persistent bad weather, they would have had "a very successful experiment". F/O Bath, the pilot concerned with this tree-top work, repeated his recommendation of the previous year that only a multi-engined aircraft, of large carrying capacity, should be used. S/L Grandy, in command at Ottawa air station, strongly supported Bath's comments. The work was "extremely dangerous" as the fully-loaded "Puffer" landed at 70-75 m.p.h., and "it can be readily imagined what would happen if a forced landing occurred when flying over the bush a few feet high as they have to."(7)

High River

At High River the DH4 and Avro aircraft had now been replaced by six light "Moth" aircraft for use on forest patrol. In addition to the landing grounds at Pincher Creek and Rocky Mountain House, an experimental service was started much farther north from a temporary base at Grande Prairie to keep watch over forest lands in the Peace River district. Over 700 hours were flown on forestry patrols (as compared with 193 the previous year); eight fires were reported, seven of them in the new Peace River district. The total area patrolled was more than 3,000,000 acres.

The station, with a staff of four officers and 19 airmen under the command of F/L G.V. Walsh, was open from 17 March to 3 December.

Winnipeg

Forestry operations in Manitoba and Saskatchewan were also increased during 1928, rising from 1344 hours in 1927 to more

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(6) The undercarriage of the "Puffer" was damaged while at Westree. Later in the year the aircraft was sent to Nova Scotia, but the file (1008-17-2, vols. 3 and 4) does not disclose whether any operations were carried out there.

(7) For a detailed description of the methods used in forest dusting see Report on Civil Aviation, 1928; Appendix D (pp. 97-101). After the dusting work ended the "Puffer" was converted for photographic work to increase its utility.

than 2500 hours. To guard the 61¼ million acres in the forest reserves the four sub-bases at Lac du Bonnet, Norway House, Cormorant Lake and Ladder Lake were once again in operation, with detachments at Winnipegosis (as in 1927) and at Ile-à-la-Crosse.(8) The experience of the previous year had shown that the base at Ladder Lake was unable to provide adequate protection for the forests in northern Saskatchewan, making it necessary to establish a detachment on the west shore of Ile-à-la-Crosse Lake.(9) The fire hazard was high all summer, the season being the worst since aerial patrols were started in 1921; in the course of 567 flights from the bases and detachments 179 fires were detected, with suppression action being taken in the great majority of cases. "Vedettes" and the new "Moths" were used for detection patrols with "Varunas" for suppression work. Cormorant Lake was the most active of the bases, the division of time on forest patrol and other duties being:

Lac du Bonnet	(S.E. Manitoba)	623.40 hours
Norway House	(N.E. Manitoba)	444.55 hours
Cormorant Lake	(N.W. Manitoba)	795.20 hours
Ladder Lake	(N. Saskatchewan)	627.50 hours
Winnipegosis	(S.W. Manitoba)	87.05 hours
Ile-à-la-Crosse	(N. Saskatchewan)	193.25 hours
		2772.15 hours

In the Saskatchewan patrol areas fires were not, as a rule, reported by wireless from the air. Only a few of the aircraft were fitted with wireless as normally they carried a forestry observer and fire fighting equipment while on patrol. The procedure then was for the aircraft to land at one of the wireless ground stations and send to forestry headquarters a full report on conditions in the area covered during the patrol.

In addition to these bases and detachments Winnipeg air station also had a detachment for wheat-dusting (referred to elsewhere) and another detachment at Fort Churchill. The latter unit, located at a temporary base on Deer Lake at Mile 437 on the Hudson Bay Railway,(10) was engaged in transporting personnel of the Department of Railways and Canals from the end of steel into Fort Churchill, and in making coastal ice patrols along the west coast of Hudson Bay from Nelson to Churchill. Its two Fairchild aircraft, flown and maintained by two officers and seven airmen, logged about 550 hours during the season. There was also much transportation flying (367 hours) by the various bases to carry supplies to the photographic detachments operating in the prairie provinces.

The total strength of Winnipeg air station was 25 officers and 72 airmen under the command of S/L L.F. Stevenson; 26 aircraft

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(8) Each of the sub-bases had a "Varuna", a "Vedette" and a "Moth"; the two detachments each had one "Vedette".

(9) The headquarters of the Saskatchewan Forestry Service was at Prince Albert. As the waters of the Saskatchewan River there were not suitable for the operation of flying-boats or seaplanes, the main air base had been established on Ladder Lake near Big River.

(10) The little lake was three-quarters of a mile wide and one and a quarter miles long.

were in use-8 "Vedettes", 7 "Moths", 4 "Varunas", 4 Fairchild monoplanes, 2 "Vikings", and 1 "Puffer".

Ottawa

The station at Shirley's Bay, staffed by 12 officers and 45 airmen under the command of S/L R.S. Grandy, was active from April to December on many varied duties - training, air mail and air route investigation, transportation, photography, test flying, wireless experiments and dusting.

One of the flights undertaken from Ottawa was an experimental air mail service by seaplane to Vancouver.(11) S/L Godfrey, who had flown the route two years earlier with Dalzell McKee, was the pilot for the flight with WO M. Graham as his air engineer. The aircraft was a new Fairchild FC 2W seaplane which the manufacturer loaned to the Department for the trial flight. Taking delivery of the Fairchild at Farmingdale, L.I., Godfrey flew it to Shirley's Bay on 1 September and prepared to take off the next day. After a false start on which weather forced the seaplane down in northern Ontario, Godfrey finally got away from Shirley's Bay on 5 September and reached Lac du Bonnet that evening after a non-stop flight of 1100 miles. The next day two legs were completed to Ladder Lake (550 miles) and Edmonton (275 miles). Up to this point the flight had made good time, but bad weather-rain and sleet-now intervened, and the seaplane was grounded at Edmonton until the morning of the 8th. A short hop to Wabamun followed by a non-stop flight to Vancouver completed the last 790 miles of the route in seven hours' flying time, 82 hours after leaving Ottawa.(12)

Picking up W/Cs Gordon and Breadner who were on a staff visit to the Pacific coast, Godfrey and Graham set out on a return trip (without mail) on the morning of 10 September. The route took the seaplane north to Prince Rupert, and thence westward to Fraser Lake where No. 1 Photo Detachment was based temporarily. On the 14th the Fairchild flew on to Peace River to refuel before continuing northward to Fort Smith, N.W.T., to inspect photo detachments working in the Lake Athabaska area. After the aircraft and its crew of four left Peace River on the morning of 15 September silence descended for four days. Then reports began to come through that the Fairchild had been forced down near its destination by fog and smoke, and that it had been seen on the Peace River with broken floats. The rumours could not be confirmed; neither Fort Smith nor Fort McMurray had any definite information about the missing aircraft. Searches were initiated from Ladder Lake and other bases, but the aircraft had not been located when, on the evening of 24 September, headquarters in Ottawa finally received definite word about the missing men in the form of a message from the government telegraph agent at Peace River which was relayed through Winnipeg. On the morning of the 26th a confirming telegram arrived from W/C Gordon.(13)

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(11) See file 1008-1-58 (two vols.).
(12) The small bag of mail carried on the flight immediately became collectors' items. A few months later covers were selling at $25 each.
(13) Gordon's telegram, sent as a night letter from Peace River on the 23rd, was delayed in transmission at Edmonton. The press had news that the men were safe three days before headquarters did.

About two hours after leaving Peace River on the morning of the 15th, the aircraft encountered such dense smoke from heavy bush fires that the pilot was forced to attempt a landing on the river at a cabin some 15 miles north of Carcajou and 100 miles south of Fort Vermilion. The seaplane was wrecked in the forced landing, but the four men escaped injury. A boat passing by on its way from Fort Vermilion to Peace River Crossing picked up Gordon and Breadner, and F/L Mawdesley subsequently flew them down to Ladder Lake. Godfrey and Graham remained at the scene of the crash to salvage the motor before making their way to Peace River and thence to Edmonton.

On the flight from Shirley's Bay to the west coast S/L Godfrey carried three "limited" emergency kits and one larger kit. The smaller kits contained:

2 lbs. ship biscuits
1 tin bully beef
1 lb. chocolates
1 tin condensed milk
1 tin condensed coffee
1 tin tabloid tea
1 phial "Saxine"
1 billy canteen
3 boxes safety matches
1 pocket compass
1 mosquito helmet
1 rucksack

The larger kit held:

2 lbs. ship biscuits
4 tins bully beef
1 lb. chocolate bars
8 ozs. "Klim"
2½ ozs. coffee
3 ozs. tabloid tea
1 oz. "Saxine"
1 billy canteen
4 boxes matches
medicine kit
1 pocket compass
1 mosquito helmet
1 rucksack
1 forester's axe
1 clasp knife
1 fish line
2 trolling lines
10 fish hooks
2 trolls
1 ground sheet
1 flashlight
1 booklet "Camp Craft" published by the C.N.R.

Radio communications

The radio system operated by the RCCS in western Canada was expanded by the extension of forestry patrols into northern Saskatchewan.(14) As the distances between the air and forestry bases here were much shorter than in Manitoba, the standard

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(14) The radio station at Jericho Beach, closed in 1927, remained inactive through 1928.

SITD 500-watt wireless stations were much too powerful. To meet the special conditions of the new area the Signals Inspection and Test Department set out to design new equipment that (1) would not require a station battery, (2) would be automatic in operation, (3) would be portable (no individual part weighing more than 200 lbs.), (4) would be capable of erection by not more than two men and operation, if necessary, by one, and (5) would be capable of installation in any type of building in any locality. The answer to these various requirements was the SITD 100, operated by a small one hp automatic Delco gasoline power plant which developed 32 volts direct current.(15) A special erecting staff under Lt. Young of the RCCS was sent from Ottawa to install the sets in Saskatchewan, and the new system came into operation as a whole in August 1928. At Prince Albert, Ladder Lake and Waskesiu a small standard station building was designed and erected, but at Ile-à-la-Crosse and Lac la Ronge the sets were installed in existing buildings. The first year's operation showed that the SITD 100 met the requirements very well, and the northern Saskatchewan radio system was a great boon also to trading companies and settlers in the area. In addition to service messages the stations handled considerable commercial traffic, and some were kept open through the winter after flying operations ceased.

The four stations in the Manitoba system at Winnipeg, Lac du Bonnet, Norway House and Cormorant Lake were supplemented by a small station opened in the fall of 1928 on Snake Island in Lake Winnipegosis. This station and another which was to be opened at Berens River in the spring of 1929 had the new 100-watt units.

At High River the single wireless mast that had been used in earlier years was dismantled in July 1928 and replaced by two 100-foot lattice steel masts which, together with the radio station, were moved well to one side of the flying field. The new "Moth" aircraft used on forest patrol at High River were now equipped with the CT21 type aircraft transmitter which had been designed and built in the Signals Workshop of the RCCS. For the past six years aircraft on these patrols had carried the T21 transmitter, originally a war-time product used by the RAF for long range communication between aircraft and ground. Various improvements had been made in mechanical details since the war, and a telephone attachment, in a separate case, had been provided to allow the use of either speech or key. Nevertheless, although the T21 had on the whole given satisfactory results in Canada, certain mechanical and operational difficulties had been encountered which the new CT 21 set was designed to overcome. Compact, the CT 21 fitted into a case measuring about 9 by 12 by 13 inches, with a remote control attachment in another box 6 by 9 by 3 inches in size. The set was mounted in the aircraft on coil springs instead of rubber cords as in the past.(16) After eighteen months constant use on forestry operations and with the Hudson Strait Expedition the CT 21 proved efficient and free from operating troubles.

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(15) For a detailed description of the SITD 100 see Report on Civil Aviation, 1928; pp. 84-85.
(16) For technical details and photographs see Report on Civil Aviation, 1928; pp. 88-91.

Radio aids to navigation

At the request of the RCAF and commercial pilots, the RCCS staffs at the western radio stations in the late summer of 1928 began routine broadcasting of weather reports. Each morning and evening reports, prepared in a form most useful for aviation, were broadcast from High River, Edmonton, Prince Albert, Cormorant Lake and Winnipeg, and the combined forecasts were passed by the stations to local newspapers, flying clubs and aircraft companies. This was "the beginning of the system of radio aids to air navigation which the Department intends to install and operate on all airways in Canada."(17)

Similarly in eastern Canada the development of air mail services required the establishment of various radio aids. In the fall of 1928 a small experimental station was erected at St. Hubert to assist in the air mail flights for the Post Office Department. The station received weather broadcasts from all Canadian and American stations in the eastern half of the continent and transmitted a forecast of weather conditions along the Montreal-Toronto and Ottawa-Montreal routes just before the mail planes took off. Further experimental work was planned for the summer of 1929 with radio beacons, radio direction finders and transmission of weather information to aircraft in flight.

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(17) Report on Civil Aviation, 1928; p. 92.

D. Aeronautical Engineering Division

The research branch of AED was concerned with development work on the Vickers "Vista", the Vickers "Vancouver", and the Fairchild FC 2W. The Wasp-engined Fairchild was used extensively on photographic work at altitudes of around 16,000 feet, while the "Viking", "Vedette" and Whirlwind-engined Fairchild FC2 (commonly known as the "Razorback") worked at heights of 5,000 to 9,000 feet. The little all-metal singleseater "Vista", with a Genet engine, was given test flights which showed that a flying-boat of so small size was suitable only for use in sheltered waters.

Another of the Vickers projects, the twin-engined "Velos" designed for photographic work, was a failure. When first launched in November 1927 the aircraft was so overweight and tail-heavy that no attempt was made to fly it. As it lay at its moorings in the river, the "Velos" was almost submerged by a heavy accumulation of snow on the tail surfaces - an omen of its ultimate fate. After various modifications the aircraft was test flown in August 1928 by S/L Grandy who reported it was "most unsuitable"; the climb and speed were poor, the controls sluggish and layout impractical. After further alterations the "Velos" was given another test flight at Montreal late in November, which was discontinued when a snow-storm was encountered at 5000 feet. During the night ten inches of snow fell, and in the morning the "Velos" sank tail first at its moorings.

Canadian Vickers were now working on another design, the "Vancouver", which was a development of the "Varuna", with a duralumin hull and two tractor "Lynx" engines. The research branch was closely associated with all this development work, examining details of design, carrying out stress analyses, etc. Some time was also devoted to the production of combined ski-wheel and ski-float undercarriages, but it was recognized that "these problems.. depend largely upon the demand being sufficient to warrant the cost of the experimental work."(1)

The airworthiness and inspection branches were becoming increasingly busy as civil and commercial aviation expanded rapidly in the Dominion, and more types of aircraft had to be certified. By an agreement with the United States, airworthiness certificates issued by the American Department of Commerce for aircraft built in the United States were recognized in Canada, and vice versa. To inspect aircraft during construction, prior to the granting of certificates, Aircraft Inspection Detachments (AIDs) were stationed in Montreal and Ottawa; another was to be located in Winnipeg.

W/C Stedman, the Chief Aeronautical Engineer, visited several European countries in the summer of 1928, to study their aircraft industries and in particular the construction of metal aircraft. He also visited the US Naval airship station at Lakehurst to obtain information relative to the construction of airship mooring facilities at St. Hubert.

Canadian Aircraft industry

The aircraft industry was expanding as more companies established plants in Canada. In addition to Canadian Vickers

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(1) Report on Civil Aviation, 1928; p. 68.

in Montreal which was producing "Vikings", "Vedettes", Avros and Fairchilds for the Department of National Defence, Curtiss-Reid Aircraft Company, Limited, had opened an airport at Cartierville and were producing the "Rambler", a light two-seater with all-metal airframe and fabric covering. At Mount Dennis, Toronto, de Havilland Aircraft of Canada Limited had established a plant to assemble and service their famous "Moth". Other companies engaged in manufacturing, repairing or assembling aircraft and engines were the Ottawa Car Company Limited, Armstrong-Siddeley Motors Limited, Canadian Wright Limited, and Canadian Pratt and Whitney Company Limited.

Chapter XIII

A. Parliament 1929

For the government air services in the fiscal year 1929-30 parliament appropriated a sum of $5,921,163, an increase of somewhat more than $875,000 over the previous year. As usual the sum was divided into two votes, one for the RCAF and the other for Civil Air Operations. The RCAF item was originally $1,697,694, the same as the previous year, to which a supplementary item of $250,000 was added for preliminary work on a new training station at Trenton. The civil air vote was $3,973,469, an increase of $628,432.

When the National Defence estimates were presented in the closing days of the session, Miss Macphail, supported by other members, again raised the question why civil air operations were under the control of the Department of National Defence. Once again she advocated that a department of transportation be formed to "keep civil aviation away from the military authorities." A long debate developed in which the discussion often went far afield and there appeared to be some lack of clarity in the use of the terms "civil aviation" and "civil air force" as distinct from military aviation. With respect to the military air force Mr. Woodsworth asked against whom we were preparing our defences, and expressed the opinion that if war broke out it would not take long "to transform at least" a part of the civil air force into a military one. An argument then ensued as to whether civil aircraft could be used for war purposes.

To these critics Mr. Ralston, the Minister of National Defence, replied that "no nation could be more disarmed than Canada." The inclusion of civil government air operations in his department was simply "a matter of organization"; it was more economical and efficient. At Camp Borden civil pilots were being trained as well as military and, the minister added, that station was being used "principally as a training ground for civilian work." If that statement shocked some members who felt that "we are going back on military training", Mr. Ralston pointed out that it was felt that the training given at Camp Borden "was necessary and essential for the promotion of civil aviation in this country where aviation is so beneficial." The RCAF vote was "essential for the benefit of civil government operations and civil aviation." The only exclusively military equipment in the service were a few "Siskin" fighters which had been purchased the previous year; no more were being acquired as the policy now was to buy "Moths and planes of that kind for the purpose of civil operations and to teach men in such operations." "We figured that we should turn our attention for the present entirely to civil government operations and civil aviation."

The debate then turned from "military" control of civil aviation to the establishment of a new training centre at Trenton and the proposed "abandonment" of Camp Borden. The proposal aroused strong local feeling among the Ontario members whose constituencies were affected. Members for the Simcoe ridings condemned the move from Camp Borden as "a useless expenditure of money", and suggested that Trenton, being on the boundary line between Canada "and a foreign country", was not suitable for a military camp. Other members asked why Deseronto, which had once been considered as the site for the new base, had been passed over.

Mr. Ralston explained that for some time complaints had been made that Camp Borden "was not satisfactory even for the purpose of landplane training", and on the other hand there was an increasing need for seaplane training which could not be given at Camp Borden. To convert Camp Borden into a satisfactory permanent base would cost $1,400,000, and a further $500,000 would be needed to provide a seaplane base at some other point. To avoid double overhead in training establishments, it was proposed to develop a combined station, at a cost of $1,100,000 to $1,500,000. About 30 different sites had been examined and after full investigation by technical officers, Trenton had been selected as the most suitable.

At this point the prime minister intervened in the debate to suggest that, as nearly an hour had been spent on this one item and it took some time to arrange prorogation, contentious items should be left over for the time being.(1)

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(1) Hansard, 1929 Session; Vol. III, pp. 3207-25, 3246-48, and 3747-52 (debates of 4 and 14 June 1929).

B. Royal Canadian Air Force 1929

The expansion of civil government air operations which, although controlled by a separate directorate, were carried out by RCAF personnel was accompanied by an increase in the strength of that service. The authorized peace establishment of the PAAF rose from 202 officers and 803 airmen at 1 April 1928[1] to 249 officers and 908 airmen a year later.[2] The "limited establishment" authorized by the Minister for the respective fiscal years did not rise quite so rapidly, the figures being 176 officers and 641 airmen for 1928-29, and 204 officers and 732 airmen for 1929-30. Of the 936 officers and airmen in the limited establishment, about one-half were allotted for duty with the three "civil" branches, 78 officers and 332 airmen being detailed for the CGAO Directorate, 10 officers and 10 airmen for the Aeronautical Engineering Division, and 3 officers for the Controller of Civil Aviation, leaving 113 officers and 390 airmen for the RCAF itself. Although the actual strength of the service remained well below the limited establishment, the RCAF did increase its numbers by 44 officers and 79 airmen during the 1929-30 fiscal year to reach a total of 175 officers (85 of whom were Non-Permanent on continuous service) and 669 airmen. Distribution of the personnel at 31 March 1930 was: Ottawa 281, Camp Borden 358, Winnipeg 141, High River 27, and Vancouver 37.

There was a sharp increase in the amount of flying during the year with a total of 10,537 hours logged, representing an increase of more than 50% over the previous year. Service flying, which included instruction, accounted for 9630 hours, the balance being divided between transportation (520 hours), aerial photography for the Army (192 hours) and miscellaneous duties (195 hours). The great bulk of the flying was carried out from Camp Borden, but Vancouver, the seaplane training centre, was much more active than in previous years, recording 2065 hours, or almost three times as many as in 1928. Under the direction of S/L E.L. MacLeod, who succeeded F/L Hull in command at the end of March 1929, seaplane courses were given for 51 RCAF pilots and 4 civilians. "Vedette" flying-boats and "Moth" seaplanes were used for the conversion training.[3]

At Camp Borden there were the usual courses for service personnel in refresher flying (29 pilots) and flying instructors (22 officers), as well as two civilian courses for three commercial pilots and 25 flying club instructors. One of the civilian pilots, Mr. J.W. Abray, was killed in the crash of a "Moth" on 6 April 1929 while taking the club instructors course. The two-month technical training course for boys was attended by 40 trainees, and the annual parachute course by 17 officers and airmen.

The fourth ab initio flying training course for airmen pilots, which began in October 1929, graduated nine sergeant pilots six months later. The number of trainees in the P/P/O

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(1) P.C. 795 of 10 May 1928.
(2) P.C. 1769 of 11 September 1929.
(3) The station also did a small amount of civil flying on customs patrols and geodetic survey. Pigeon training flights were also made to give young birds practice over different routes.

course continued to rise with 80 candidates in attendance during the summer months. In the first term there were 42 cadets, including eight from RMC; 24 of the group eventually qualified as pilots. For the second term 28 trainees reported, two of whom, H.R. Carefoot and D.F. MacDonald, continued training after the summer term ended and won their wings at the end of September. Ten pupils were in the third term; nine received their flying badges at the end of the course, with P/P/O G.F. Kimball winning the Sword of Honour. Among the graduates were F.M. Gobeil, R.C. Hawtrey, R.C. Mair and C.W. Morrison who subsequently received commissions in the Permanent Force.

Ten officers were attending courses abroad in the United Kingdom during 1929, at the RAF Staff College (S/Ls Cuffe and Walsh), R.N. Staff College (S/L Shearer), the RAF School of Air Pilotage (F/L G.A. Mercer), Central Flying School (F/Os Harding and F.G. Wait), Army Co-Operation Course (F/O Lewis), Storekeeping Course (F/L Wylie), and the Imperial College of Science (F/Os Adams and James). The first group of exchange officers returned to Canada early in the year and were replaced by S/L D.C.M. Hume and F/Ls H.W. Hewson, A.H. Hull and R.A. London, while the RAF sent out F/Ls F.V. Beamish, N.C.O. Forbes, D.F. Lucking and F/O T.A. Head. S/L L.F. Stevenson took over the post of RCAF Liaison Officer at the Air Ministry in succession to S/L Cuffe.

For service training with the other forces seven combined operations (totalling 178 hours) were carried out, which included tactical exercises, reconnaissance and transportation of Army and Navy officers.

There were five fatalities in the service during 1929, four of which were on flying operations. F/O G.R. Stafford was killed in the crash of an Avro 504N while making a test flight to Camp Borden on 16 August 1929. Another test flight at Montreal on 4 November took the lives of F/Os P.G. Stanley and J. McLaughlan from the staff of the Aeronautical Inspection Detachment who were testing a Vickers "Vedette". On Civil Government Air Operations F/O G.A.A. LeMoine was killed at Lac du Bonnet on 10 September while carrying fire-fighters on a "Vedette". An airman died at Camp Borden from natural causes.

Construction work, handled by the Army's Directorate of Engineer Services,(4) totalled $528,366 during the year, an increase of $112,730 over 1928. One of the major items ($151,166) was preliminary grading and construction for the new air station at Trenton where 886 acres were expropriated on 22 October 1929.(5) Improvements to the aerodrome at Rockcliffe, where Ottawa air station was relocated early in 1929, cost $155,020 and alterations, repairs, etc. to the old station at Camp Borden $92,221.

One hundred and twenty-nine Army personnel were attached to the RCAF and other branches of the government air service. Two officers and seven other ranks of the RCAMC provided medical

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(4) The Royal Canadian Army Pay Corps was responsible for the issue of pay and allowances to personnel of the R.C.A.F., and the Army's Directorate of Equipment and Ordnance Services provided and distributed clothing and non-technical stores.
(5) P.C. 2011 of 9 October 1929 authorized acquisition of the site.

attendance for RCAF personnel, while seven officers and 113 men of the RCCS, almost one-half of the total strength of that Corps, were employed on the radio systems used for air operations. The bulk of the Signals personnel, six officers and 62 other ranks, were engaged on the fifteen stations in the Alberta, Saskatchewan and Manitoba systems which served the Directorate of Civil Government Air Operations. In Alberta there were stations at High River and Grande Prairie, in Saskatchewan at Prince Albert, Ladder Lake, Ile-à-la-Crosse, Lac la Ronge, Waskesiu and Pelican Narrows, and in Manitoba at Winnipeg, Lac du Bonnet, Norway House, Cormorant Lake, Winnipegosis, Berens River and Thicket Portage. Nine signallers were with the RCAF for the stations at Camp Borden and Ottawa, and one officer and 42 other ranks on duties connected with air mail routes, including the station at St. Hubert.

C. Civil Government Air Operations 1929

The Directorate of Civil Government Air Operations flew about 11,000 hours during the calendar year. In addition to the three stations at Ottawa, High River and Winnipeg (with its numerous sub-bases), there were once again eight photographic detachments in the field. Seventy-six aircraft were in service, the mainstays being the Fairchild (22 of several types), the "Vedette" (19), and the "Moth" (17). New models appearing this year were the Bellanca "Pacemaker", the Curtiss-Reid "Rambler", the Fairchild 71, the Ford trimotor, the Pitcairn "Mailwing", the Vickers "Vancouver", and the Vickers "Vigil", each represented as yet by only one or two specimens.

Forestry patrol

More than half of the CGAO flying (5796 hours) was on forest patrol in the three prairie provinces where the natural resources were still under the control of the Dominion government. The total area covered by the patrols was more than 92,000,000 acres. High River, reopened on 18 March after being on care and maintenance through the winter, continued its work over the Bow River, Crowsnest and Clearwater reserves, using the temporary landing fields at Pincher Creek and Rocky Mountain House for the southern and northern patrols. The experimental service which had been started the previous year at Grande Prairie to keep watch over a large forest area in the Peace River district was also continued; a radio station for air-to-ground communication was now in operation at this sub-base. In the course of almost 1300 hours on forest patrol (600 more than the previous year) four fires were detected in the southern reserves and 39 in the Peace River area. S/L A.A. Leitch was in command of the staff of five officers and 21 airmen; six D.H. "Moths" were in service.

In Saskatchewan and Manitoba forest patrols were expanded by 2,000 hours in 1929, more than 4500 hours being flown to guard 57,125,000 acres stretching from the border of Alberta to the Ontario boundary line. In addition to the four major operational bases at Lac du Bonnet, Norway House, Cormorant Lake and Ladder Lake, forestry detachments were located at Winnipegosis, Berens River, Thicket Portage (at Mile 185 on the Hudson Bay Railroad), and Lac la Ronge. The last three were new locations. Berens River was on the eastern shore of Lake Winnipeg about half-way between Lac du Bonnet and Norway House; Thicket Portage extended the Cormorant Lake patrol area northeastward along the Hudson Bay line; and Lac la Ronge, replacing Ile-à-la-Crosse, gave more effective cover of the eastern Saskatchewan area. Each of the eight air bases was provided with radio communications, and there were also radio stations at Waskesiu, Ile-à-la-Crosse and Pelican Narrows in Saskatchewan, as well as at Forestry headquarters in Winnipeg and Prince Albert. The four main bases were also equipped with pigeon lofts to provide emergency communication between aircraft and station. Five forced landings were reported by pigeon message, thereby saving much time in searching for the missing aircraft.

The 1929 season was a bad one for fires, 325 being detected from the air. Reserve aircraft and machines engaged on other operations had to be pressed into service for suppression work. This year patrols from the four main bases began in March, before the spring break-up, using aircraft fitted with skis, and this early start was very beneficial to the forestry service in dealing

with the first outbreaks in the forests.

F/O G.A.A. LeMoine was killed in a flying accident while on forest patrol on 10 September. He was returning to base at Lac du Bonnet late in the evening, with two fire-fighters in his "Vedette", when due to heavy smoke haze he misjudged his landing on the glassy water and the aircraft broke up on impact. LeMoine and one of his passengers died in the crash; the second passenger was rescued by the station motor-boat. In another accident a pilot was forced to take to his parachute when his "Moth" refused to come out of a dive. The pilot landed safely in the water of the lake and, although his inflatable life-belt did not function, he swam 200 yards to shore. This appears to have been the first emergency use of the parachute in RCAF history.

The value of winter forest patrols before the spring break-up cleared the ice from the lakes was well illustrated by the results achieved at Cormorant Lake sub-station which was opened by F/L F.J. Mawdesley on 12 March. In the next two months he dealt with eleven forest fires, transporting fire hose, pumps, supplies and fire-fighters to outbreaks which could not have been reached quickly enough, if at all, by other means of transportation. On one day he made eleven flights to disembark fire-fighters and equipment. The fire hazard was particularly bad between 6 and 11 May when the sun was strong enough to dry out the moss and undergrowth. At that time of the year, although the streams were free of ice, the lakes were clear only along the shore-line, and travel across country by any means other than aircraft was impossible. Changing his Fairchild from skis to wheels, Mawdesley carried on with his flights until the ice in the centre of the lakes became too soft to operate aircraft. So that the fire-fighters and their equipment could reach shore after being landed on the ice in the lakes, a collapsible canoe was carried in the aircraft on which the men crossed the intervening stretches of water. Mawdesley's commanding officer reported that his work "at the dangerous fire hazard period, just before break-up, was exceptionally commendable, and proved of great assistance in controlling the fire situation in the Cormorant Lake district at the most difficult time of the year."(1)

The early inauguration of air patrols had definite humanitarian benefits also at the season when other means of communication and transportation were almost impossible. On one of his first flights, a fire detection patrol on 28 March during which he landed at the settlements on Island, God's and Oxford lakes, Mawdesley learned that there had been destitution, sickness and numerous deaths during February at two of the settlements. On his return to Cormorant Lake Mawdesley reported the situation to the Indian agent at Norway House and three days later he returned to Island Lake and God's Lake, carrying with him the agent, a doctor and an RCMP constable. Thanks to Mawdesley's report and his mercy flight it had been possible to make prompt arrangements to relieve the distress of the natives; dog train, the only other means of transport at that time of the year, would have been hazardous and would also have meant serious delay in bringing aid.

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(1) Report by S/L N.R. Anderson, 18 January 1930, on AFHQ file 821-4, vol. 2.

Several weeks later, on 2 May, a request was received from the Bishop of Keewatin to send help to one of his missionaries, Archdeacon Faries, who was seriously ill with typhoid fever at York Factory on Hudson Bay. At daylight the next morning Mawdesley took off from Cormorant Lake with a doctor, two nursing sisters and a mechanic, and reached York Factory early in the afternoon where he made a skilful landing on the very rough ice in front of the post. Shortly after the party arrived at their destination, a terrific gale and snowstorm blew up, piling the snow in huge drifts around the Fairchild as high as the wings. For three days Mawdesley was unable to get away. Then, by skilfully manoeuvring the aircraft between the snow drifts, he was able to take off and returned to Cormorant Lake in a 5½ hour flight. The Bishop of Keewatin expressed his thanks for the "fine service ..... which evidently was the means of saving the life of a valuable Missionary."(2)

On yet another occasion that year Mawdesley demonstrated the versatility and time-saving ability of air transport. An aircraft that was being prepared to fly a survey party in to Pukkatawagan became unserviceable when the propeller was damaged in a test flight. The nearest spare was at Berens River, 200 miles away, and to bring it in by ground transport - by boat to Selkirk and thence by rail to Cormorant - would involve a serious delay of at least one week. "Mawdy" came to the rescue. Flying a "Varuna" down to Berens River, he lashed the large four-bladed airscrew to the centre section of the hull of the flying-boat and returned to Cormorant. Within two hours of his arrival the new propeller had been tested and the survey party was on its way to the north.

By these and other services, typical of those performed at many air stations, F/L Mawdesley proved "the exceptional merit and usefulness of the air service to Canada in general and Dominion Government departments in particular" and showed how "the gratitude, admiration and loyalty of the people in outlying settlements" could be won by the use of aircraft to supply their needs in time of distress and sickness.(3)

Photographic operations

Eight photographic detachments were in the field from British Columbia to the Maritimes. Each detachment had a staff of two officers and three or four airmen, with two aircraft; five of the detachments flew Fairchild FC2s, the other three had "Vedettes". The total flying time logged by the detachments was 3243 hours, of which 2927 were on photography and the balance on transportation and reconnaissance.

No. 1 P.D. worked in British Columbia, chiefly in the Parsnip River area. Nos. 2, 3, 4 and 5 ranged from north-western Ontario to northern Saskatchewan, the major areas covered being around Mimimiska Lake on the Albany River, Quetico and Rainy Lakes, the Winnipeg and English Rivers, Flin Flon, Kississing and Granville Lakes, Cormorant Lake, Nelson House, Foster Lakes, and the Mudjatic River. In eastern Ontario and

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(2) All the commercial companies in the area had removed their aircraft from service to await the spring break-up.
(3) Report by S/L N.R. Anderson, 18 January 1930.

western Quebec Nos. 6 and 7 P.D.s were active around Lake Nipissing, Blue Sea Lake, Senneterre, Rouyn, Doucet, Lake Olga and Quebec; and in the Maritimes No. 8 P.D. completed one major task in the Moncton area as well as several smaller operations in Nova Scotia. The total area covered in all these photographic operations was 74,655 square miles, for which 97,742 negatives were exposed.

Forest-dusting experiments

The Department of Agriculture proposed to continue its wheat-dusting operations in Manitoba, but an accident to the Keystone "Puffer" at the beginning of the work necessitated a cancellation of the plans.

Although the Department of National Defence was willing to continue wheat-dusting with single-engined aircraft, it urged that for forest-dusting a new type of aircraft was necessary which would not involve "undue risk" to the personnel. Officers of the Department of Agriculture were anxious to continue to work against the spruce budworm and a new menace, the hemlock looper, which had infested balsam fir stands in Quebec. To meet the requirements for greater carrying capacity and greater reserve power, the Department of National Defence purchased from the Stout Metal Airplane Company of Dearborn, Mich., a Ford trimotor which was the only multi-engined aircraft that could be delivered in time (15 May) for the summer's operations.(4) F/L N.C. Ogilvie Forbes, an RAF exchange officer, was placed in charge of the Ford ("WZ") with Sgt. F.J. Ewart as second pilot.

The first operation with the Ford was a continuation of experiments against the spruce budworm in the vicinity of Westree, Ont. The Ontario Forestry Branch provided a camp, 15 tons of calcium arsenate, and six men as ground assistants; the Entomological Branch of the Department of Agricultural supplied a staff to direct the experiment, and the CGAO Directorate provided the aircraft, crew and equipment. On 14 June Ogilvie Forbes and his crew left Ottawa with the Ford seaplane and reached the Westree camp the following day after making three forced-landings en route due to oil trouble in the centre engine. Oil pressure trouble persisted, and some difficulty was also experienced with the new hopper which at first delivered too thin a cloud of dust. The experiment, however, was completed on 27 June after about eleven hours of dusting, and the crew returned to Ottawa.(5) Although examination indicated a heavy mortality among the budworm caterpillars, the results of the experiment were on the whole inconclusive.

The second operation, against the hemlock looper, was planned for the Manicouagan area on the lower St. Lawrence. P/O C.R. Dunlap was sent in advance to select an anchorage site in the

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(4) The 600-lb. hopper used in the "Puffer" was rebuilt to carry 2000 lbs. of dust.

(5) Transportation and engine tests took an additional eleven hours. The need for ingenuity on these detached operations was illustrated when the engine-starting crank was lost overboard and a temporary makeshift had to be contrived from a piece of gas piping until a replacement handle could be made in Sudbury.

estuary of the river, and Ogilvie Forbes, after having the engines serviced at Ottawa, flew the Ford to Manicouagan on 4 July. The engine trouble had now been overcome, but there was some difficulty with the hooper which made it necessary to reduce the dust load to 1000 lbs. Another delay was caused by damage to struts and longerons sustained in landing in a heavy swell at Franquelin; after temporary repairs it was necessary to return the aircraft to Ottawa for further repair. Resuming operations at Manicouagan a few days later, Ogilvie Forbes and Ewart completed the operation on 29 July. In about 12 hours flying[6] 15 tons of calcium arsenate were spread on the trees, the flights averaging about 20 to 25 minutes to dissipate one load (1000 lbs.) of dust. Most of the flights were made at dawn when the air was calm with fairly high humidity. The Ford flew as close to the tree tops as possible, usually some 20 to 40 feet above the higher trees. Dr. Swaine reported that the experiment was "a complete success", over 90% of the hemlock looper caterpillars being killed and the outbreak in that area being completely checked. The Executive Council of the Quebec Forest Industries Association Limited passed a resolution of thanks to the Director of Civil Government Air Operations "for his whole-hearted and effective co-operation in the measures taken to combat the hemlock looper attack."[7]

Winter flying experiments

Early in 1929 S/L R.S. Grandy, in command of Ottawa air station, suggested that some experiments be carried out during the coldest period of the winter to determine the feasibility of operating aircraft away from civilization without any outside aid, all the necessary equipment being carried on the aircraft. He proposed that an aircraft be flown to some lake north of Ottawa, remain overnight and return the next morning. His proposal was approved, to be carried out in conjunction with flights for the Geodetic Survey, and on 23 February the first experiment was made.

Leaving Rockcliffe with Messrs. J.L. Rannie and J.E. Ross of the Geodetic Survey as his passengers on a Fairchild FC2, Grandy flew to Senneterre where the ground temperature was 10 degrees below zero. The next morning some difficulty was encountered in warming up the engine because the blow torches would not stay lighted, but eventually a three-hour reconnaissance flight was made. On the 25th another flight was made

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(6) Transportation flights to and from the scene of operations took an additional 23 hours.

(7) The Quebec Forest Service, the Quebec Forest Industries Association, the Entomological Branch of the Department of Agriculture and the C.G.A.O. Directorate all co-operated in the experiment. The cost of the dust and general expenses were borne by the Anglo-Canadian Pulp and Paper Mills Ltd., the Ontario Paper Company, and the Quebec government. For a detailed description of the experiment see report by Dr. J.M. Swaine, Associate Dominion Entomologist, printed in Report on Civil Aivation, 1929; Appendix A, pp. 72-87. A smaller aircraft would reduce the cost (roughly $6 an acre); a more efficient hopper and dust with a greater degree of adhesion were also necessary.

to locate geodetic triangulation points. The return flight to Ottawa the next day ended in a forced-landing on the Ottawa River, due to carburetor freezing, with some damage to the airframe. Except for this trouble with ice formation in the carburetor intake in humid air conditions,(8) the Wright engine in the FC2 gave satisfactory service, but the over-all performance of the aircraft was "very poor" as it required a run of almost a mile to get off on calm days. The engine heating equipment - an asbestos-lined engine cover with stove pipe and blow torch - also gave poor results.

A fortnight later, on 8 March, Grandy set out again for another experiment with a Wasp-engined Fairchild FC2W and new heating equipment consisting of a special engine tent with plumbers fire-pots. Mr. Rannie again accompanied him, with Mr. F. Steers from the Geodetic Survey, and Sgt. S.A. Greene as crewman. Oskelaneo was used as the base for several reconnaissance flights for the surveyors during a five-day sojourn in the bush. The "Wasp" engine gave no trouble and, thanks to the greater power, the FC2W was able to take off in 100 yards, carrying a heavier load than the FC2. The new heating equipment was also quite satisfactory. The only difficulty experienced was with the skis in soft, slushy snow. At Grandy's request, further experiments were carried out in the winter of 1929-30 to investigate various problems such as the action of skis on take-off and landing; methods of securing aircraft in the open; heating apparatus for easy starting; tents, snowshoes and other equipment required; emergency rations and extra winter clothing.(9)

CGAO Stations

High River air station was engaged almost exclusively in forest patrol, using two landing-grounds in the southern area and a temporary base at Grande Prairie in the Peace River district. A small amount of flying was done for transportation, test and miscellaneous services.

Winnipeg air station was still expanding its activities and logged a good half of the total flying time of the CGAO Directorate - about 5600 hours out of the total of 11,000. Under S/L N.R. Anderson's command were 22 officers and 111 airmen with a fleet of 37 aircraft. The greater part - 80% - of the flying was on forest patrol from the bases at Lac du Bonnet, Norway House, Cormorant Lake and Ladder Lake and the detachments located at Berens River, Thicket Portage, Winnipegosis and Lac la Ronge. The station also did some photography and a considerable amount of transportation work to support the photographic detachments operating in western Canada and to carry officials and supplies for several government departments. For these duties the station had formed a Transportation Flight with eight aircraft and a General Purpose Detachment with two aircraft. There was also a Dusting Flight, equipped with one Keystone "Puffer", but its experimental work in wheat dusting was cut short by damage to the aircraft.

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(8) In 1931 and 1932 the RCAF sent detailed reports to the Air Ministry and the Aeronautical Research Committee of the (U.K.) National Physical Laboratory describing its experience with ice formation in carburetors.
(9) AFHQ file 1008-1-10.

At the beginning of 1929 the air station at Ottawa was moved back to its original site at Rockcliffe. Late in 1927 it was decided that a combined land and water base was necessary at Ottawa and that some other site must be found to replace Shirley's Bay where only water facilities were available. The old site at Rockcliffe, which had been used from 1920 to 1924, was regarded as suitable for the dual role, with the addition of about 22 acres to provide an adequate airfield. The additional land was acquired,(10) construction work began and at the beginning of the 1929 season the station was once again operating from Rockcliffe. S/L R.S. Grandy was in command with a staff of 14 officers and 54 airmen and a varied complement of 17 aircraft. The station's operations were as varied as its aircraft. Transportation was the major role, but there was also much experimental flying to test aircraft, engines, instruments, wireless, parachutes and other items of equipment. The station was also engaged in the investigation of air routes and making experimental air mail flights for the Post Office Department along the Ottawa - Montreal - Halifax route to determine the feasibility and approximate cost of such a service. Some minor photographic operations were carried out, principally by a Mobile Photographic Training Flight that had been formed for instructional work. Two dusting experiments were also carried out by a Ford trimotor and crew from Ottawa air station.(11)

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(10) See P.C.s 2025 of 19 October 1927 and 1014 of 20 June 1928.

(11) An RCAF Communication Flight and a Service Flight were also based at Rockcliffe and added 389 hours of flying to the CGAO station's total of 1701 hours.

D. Aeronautical Engineering Division 1929

The rapid growth of the aviation industry in Canada necessitated further expansion of the Research, Airworthiness and Inspection branches of the Aeronautical Engineering Divison. The National Research Council also expanded its activities by establishing a section devoted exclusively to aeronautical research. A nine-foot wind tunnel, an engine test bed, and a 400-foot water channel were being designed and constructed for the Council's laboratory at Ottawa under the direction of Prof. J.H. Parkin who had now joined the NRC from the University of Toronto.

In research the AED was concerned with experimental tests on the new Vickers "Vancouver", which was completed and delivered during the summer, the Mark V "Vedette" with a 300 hp Wright engine, the "Vigil", the Ford trimotor, and the light Curtiss-Reid "Rambler" and Avro "Avian". Much experimental work was also done on the development of geared engines and adjustable steel propellers as well as various items of aircraft equipment such as floats, water rudder, drogues, and a combination ski-wheel and ski-float undercarriage. Studies were also made of winter flying problems, including effective engine cowlings, icing in carburetors, and methods of starting engines in low temperatures. Another study concerned the development of a wind indicator which could be thrown from an aircraft to determine the wind direction when no other means of indication existed.

Two new Aircraft Inspection Detachments were established at Winnipeg and Toronto, to join the original two at Montreal and Ottawa, and it was planned to locate another at Vancouver. The introduction of new materials, such as stainless steel, in the manufacture of aircraft required thorough inspection during construction and frequent subsequent inspection to determine the durability of the materials under Canadian conditions.

Chapter XIV

A. Parliament 1930

The appropriation for the government air services which had been rising steadily since 1923, slowly at first and more rapidly after 1926, reached a peak in the 1930-31 fiscal year when a total of $7,475,700 was allocated to the R.C.A.F., C.G.A.O., A.E.D., and Civil Aviation. The R.C.A.F.'s share was $2,510,000, an increase of almost $600,000, while the civil appropriation rose by almost $1,000,000 to a total of $4,965,700. These sums, however, were not voted by Parliament in the normal manner of estimates. The fourth session of the 16th Parliament opened on 20 February 1930 and the House was just beginning to consider the National Defence estimates when Parliament was prorogued and dissolved on 30 May. During the brief session of fourteen weeks air matters came up in the House on only a few occasions in the form of questions about the transfer of the training centre from Camp Borden to Trenton, strength, ranks and rates of pay, numbers of aircraft, and civil aviation inspectors. (1)

In the general election which followed the dissolution of Parliament on 28 July the Liberal government was defeated. Mr. King then resigned as prime minister on 7 August, and the Rt. Hon. R. B. Bennett, leader of the Conservative party, formed a new cabinet in which Lt. Col. the Hon. D.M. Sutherland held the portfolio of National Defence. The new parliament was immediately called in special session, on 8 September, to consider the exceptional economic conditions which were causing widespread unemployment throughout the country. The short fortnight session was not concerned with aviation matters.

B. Royal Canadian Air Force 1930

The fiscal year 1930-31 marked the top of a long upward climb for the R.C.A.F. before the contrary winds of economic depression forced it to lose altitude. Its financial support rose to $2,510,000 - the largest sum the service had received in the decade since it was first formed as the C.A.F.- and its strength rose to a peak of 906 (177 officers and 729 airmen) at 31 March 1931. This was an increase of 62 during the year. The strength figures included personnel, approximately half of the total number, who were detached to the civil branches, C.G.A.O., A.E.D., and C.C.A., for duty.

Flying time logged by the service during the year rose sharply to 13,996 hours, an increase of almost one-third over the previous year and twice as many hours as flown in 1928-29. The great bulk of the flying (9556 hours) was on various training courses for service and civilian pilots; practice flying accounted for 3232 hours, including 315 hours on night flying and 154 on exhibition flying. (2) Testing of aircraft and engines required 828 hours,

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(1) See Hansard, 1930 Session; Vol. I, pp. 865-6; Vol. II, pp. 1187, 1427 and 1851; and Vol. III, pp. 2115 and 2896-2906.

(2) Demonstrations of aerobatics and service flying were given at St. Hubert, Ottawa, Kingston, Whitby, Toronto, Brantford, Waterloo and London by the "Siskin" flight composed of F/L F.V. Beamish (R.A.F. exchange officer), F/O R.C. Minnes, and P/Os F.M. Gobeil, R.C. Hewtrey and E.A. McNab.

and service transportation 236. The annual combined courses were carried out with the Navy and the Army (100½ hours), and a few civil operations, chiefly customs patrols, were carried out by service aircraft (43½ hours).

The R.C.A.F. still had only two stations for service training and operations - Camp Borden and Vancouver. The latter was the training centre for seaplane pilots who were to be employed on civil government operations; about 1900 hours were flown on these courses and 35 pilots, including one civilian, were qualified. S/L E.L. MacLeod was in command at Jericho Beach.

The station at Camp Borden, commanded by W/C G.M. Croil, conducted the usual courses in air and ground training. The technical training scheme for boys reached a peak with 69 youths under instruction during the two summer months. Twenty-two officers took the flying instructors course, and five completed a course in refresher flying. A new course in "combined air pilotage and photography", to train crews for the photographic detachments of the C.G.A.O. Directorate, had 22 officers and eight airmen under instruction. For 19 civilian pilots courses were given in flying instruction, refresher flying and advanced training, which included night flying, instrument flying and navigation. Two members of the civil pilots instrument course, P/O C.A.K. Gill and AC2 N.A. Duval, were killed when their "Moth" crashed at Camp Borden on 13 February 1931.

The P/P/O Training scheme, which accounted for almost one-quarter of the total R.C.A.F. flying time, also reached its peak in 1930 with a total intake of 99 trainees. There were 46 in the first term, 32 in the second, and 21 in the third. One member of the first term, P/P/O E.W. Sorensen, was killed in a flying accident at Camp Borden on 7 July 1930 when his "Moth" collided with a "Rambler" flown by a third term pupil. The other pilot, P/P/O G.D. Pooler, was seriously injured. The first term was a "hard luck" course in that the depression forced a suspension of the P/P/O scheme before its members were able to take their third term in the summer of 1932. Twenty-seven returned to Camp Borden for the second term in 1931 and two P/P/Os, R.A. Cameron and W.I. Clements, remained at the station after the term ended to continue their training so that they could qualify for their wings in October of that year. A third pupil received his flying badge after a few weeks training in June 1932. When ab initio flying training was later resumed, seven members of the 1930 course were able to complete their interrupted course and qualify as pilots; three others eventually won their wings as members of Auxiliary squadrons.

One of the second term pupils, P/O D.M. Edwards who had graduated from R.M.C. that spring, took two months further training after the term ended to complete the tests for his flying badge.

The third term under training in the summer of 1930 had an almost perfect record as, with the exception of P/P/O Pooler who was injured in the flying accident mentioned above, every member of the course qualified for the pilot's flying badge. Nineteen graduated at the end of the term in August with P/P/O H.H.C. Rutledge winning the Sword of Honour for his course. The other member of the course, L.E. Wray who had joined it in June upon graduation from R.M.C., continued training after the term ended and, compressing three terms into five months, won his wings in November. Commissions in the Permanent Force were given to seven of the graduates, W.E. Bennett, H.L. Campbell, J.L. Hurley, W.A. Jones,

J.G. Kerr, H.H.C. Rutledge and L.E. Wray. Jones died during the war while in command of an R.C.A.F. station overseas; the others all attained air rank, and in 1957 Hugh Campbell became Chief of the Air Staff in succession to Roy Slemon who had been one of the first group of P/P/Os trained in the R.C.A.F.

Seven officers were on courses in Britain during 1930. S/L C. McEwen and F/L G.R. Howsam qualified for "p.s.a." in the eighth course at R.A.F. Staff College; F/Ls A.L. Morfee and C.R. Slemon completed the air pilotage (navigation) course at Calshot; F/L W.W. Brown took the flying instructors course in the Central Flying School; S/L L.F. Stevenson attended the war staff course at Royal Naval Staff College; and F/O A.L. James finished a year course in aeronautical engineering at the Imperial College of Science.

Instrument flying

One of the most significant developments in flying training in the R.C.A.F. was the introduction, in 1930, of special courses of instruction in instrument flying. Prior to that time pilots "flew by the seat of their pants", that is they relied upon their senses to tell them whether the aircraft was in the correct attitude, whether it was nose up, or nose down, or banking to right or left. When the pilot could see the ground his senses were an adequate guide, but when flying in poor visibility, through cloud, or at night, the senses, as experience demonstrated again and again, were far from reliable. Instruments were needed to replace the human senses and the pilot had to learn to trust them. (3)

In 1930 the R.C.A.F. became interested in American developments in "blind flying" under the leadership of Capt. W.C. Ocker, and proposals were made to introduce such training in the Canadian service. W/C Croil, commanding at Camp Borden, in recommending an "Instrument Flying and Night D.R. Navigation Course", commented that "in the past, instruction in Air Pilotage (i.e. navigation) has been more or less elementary: since it is the policy to push Air Pilotage instruction to a high standard, the need for thoroughly qualified instructors is apparent." Headquarters agreed that the course was "of such vital importance" that the use of any available aircraft was authorized. (4) Late in August a Sikorsky amphibian that was visiting Ottawa air station gave a demonstration of the Sperry "artificial horizon" which greatly impressed the R.C.A.F. officers present; "this instrument is outstanding", one of them commented.

F/L G.A. Mercer was placed in charge of the instrument flying course at Camp Borden which had several specially-equipped Moths

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(3) One of the pilots who took the first R.C.A.F. course in instrument flying summed the problem up in the statement: "the main difficulty which pilots seem to experience, at any rate at first, is to place absolute reliance and confidence in their instruments realizing that "instinct" is invariably totally wrong."

(4) See letters of 2 and 11 August 1930 on A.F.H.Q. file 477-4, vol. 1. Copies of articles on blind flying were distributed at this time to C.G.A.O. stations to impress upon pilots the importance of instrument flying and encourage them to practice it at every opportunity.

and Fairchilds. Among the instructors attending the course, that continued until the end of November, were F/Ls C.E.F. Arthur, W.W. Brown, A. Lewis, F.G. Wait, F/Os R.C. Minnes and R.K. Rose. Initially the qualification for instrument flying was laid down as the ability to fly on instruments from one point to another, distant at least one hour, with a total error of not more than ten degrees right or left of the objective. The qualification was later raised to a maximum error of not more than five degrees, plus the ability to recover from a spin with a loss of not more than 500 feet of altitude. F/L Mercer said the latter stipulation was "an impossible order" and that the absolute minimum loss of height in recovering from a spin, while under the hood, would be 1500 feet; he added, however, that the chances of a properly trained pilot getting into a spin were very remote and that if the aircraft had an artificial horizon a spin "should never occur". Investigations were also being made of the positioning and lighting of the instruments; (5) Mercer preferred instruments with luminous dials to those illuminated from the rear. (6)

Following this pioneer course at Camp Borden, S/L Grandy, the R.C.A.F. liaison officer at Air Ministry, was instructed to get full information about the navigation and instrument courses given by the Air Service Training Company at Hamble, England, and copies of the Central Flying School's reports on methods of instruction in instrument flying were distributed to R.C.A.F. stations. (7) In the spring of 1932 Camp Borden began a series of courses to train, first, pilots engaged on the Montreal-Rimouski air mail operations and then R.C.A.F. instructors and C.C.A. inspectors.

Early in 1933 F/L E.G. Fullerton returned to Canada from a course at the R.A.F. Central Flying School during which he had led a detachment on visits to stations to give a three-weeks instrument flying course for pilots of bomber squadrons. As a result of his report that R.A.F. training differed in some respects from that of the R.C.A.F., (8) the curriculum of the Canadian courses was modified to follow R.A.F. principles. At the request of Headquarters Fullerton prepared a "Sequence of Instruction in Instrument Flying" as taught in the R.A.F. and the book was duly approved (September 1933) and distributed through the service. Fullerton pointed out that in the R.A.F. ab initio pupils were required to qualify in instrument flying before getting their wings.

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(5) The instruments were the Sperry artificial horizon, the Pioneer earth inductor compass, turn and bank indicator and air speed indicator.

(6) See reports of 6 and 21 November 1930 on A.F.H.Q. file 477-4.

(7) In the summer of 1931 use of the terms "blind flying" and "safety pilot" was banned in favour of "instrument flying" and "instructor". Instrument flying was defined as "the practice of flying an aeroplane from place to place by means of the instruments installed in the aircraft and without recourse to visual observation of horizon or ground". See Weekly Order 61 of 25 July 1931.

(8) The major differences were the use of the Reid and Sigrist turn indicator, and the use of flat turns only, rather than banked turns.

Late in 1934 the R.C.A.F. ab initio flying training syllabus was also amended to include instruction in instrument flying so that in future all pilots would be qualified in that phase. (9)

Meanwhile, by the end of 1933, all R.C.A.F. flying instructors had completed one of the special instrument flying courses given at Camp Borden and every effort was then made to qualify all other flying personnel in that subject. Another series of courses began at Camp Borden, and later at Winnipeg and Ottawa, to train pilots who had already won their wings, (10) and these courses continued until by the spring of 1937 there was no further need for them. The standard ab initio flying syllabus now qualified all pilots in instrument flying before graduation.

Medical services

Three officers and nine other ranks of the R.C.A.M.C. were attached to the R.C.A.F. for medical duty. In addition to the three fatalities mentioned above and two more on Civil Government Air Operations, there was one other flying accident in which Sgt. R.W. Pike was killed. The airman was flying a Curtiss-Reid "Rambler" from the manufacturer's plant in Montreal to Ottawa air station on 27 May 1930 when the aircraft dived into the ground due to some trouble with the controls. There were six other deaths in the service during the year due to auto accidents and other causes.

Engineer services

The amount of construction work carried out on behalf of the R.C.A.F., C.G.A.O., and C.C.A. by the Army's Directorate of Engineer Services was more than doubled in 1930-31, rising by $462,159 to a total of $990,525. Almost one-half of this sum ($451,808) was expended on the development of the aerodrome at Trenton, and $113,649 on new improvements at Rockcliffe, while further development of the civil air field at St. Hubert cost $200,522. A tract of 208 acres was acquired for the expansion of Trenton, and other properties were secured for the C.G.A.O. sub-stations at Cormorant Lake, Thicket Portage, Ladder Lake and Lac La Ronge.

Aircraft

During the year the only additions to the Force's aircraft strength were eleven "Vedettes" and five "Vancouvers" for civil operations. These flying-boats were the first Canadian-designed machines to be fitted with the new Handley-Page automatic slots to reduce the stalling speed.

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(9) Operation Order 116/34 of 22 November 1934; file 477-4. Fleet aircraft were now the standard trainers in the service.

(10) These courses were usually quite small - one, two or more pupils - depending upon the availability of pilots for training.

C. Civil Government Air Operations 1930

Civil Government Air Operations reached their peak in 1930 when almost 14,000 hours were flown on forestry patrol, photography, transportation and other duties for government departments and several of the provincial governments. Forestry patrol continued to be the major task, although the volume of flying was down slightly from the previous year; over 5500 hours, or almost 40% of the total C.G.A.O. flying, was on this service. Photographic operations continued to expand, rising to almost 3500 hours, and transportation was more than doubled with over 2600 hours logged. The sub-bases and detachments of Winnipeg air station accounted for almost one-half of all the C.G.A.O. activity (about 6300 hours), followed by Ottawa air station with 2380. High River, less active than in previous years, flew 720 hours, and eleven photographic detachments logged more than 4200 hours. Ninety-three aircraft were in service. Although the fleet had grown in size, there were no new types. The little "Vedette", comprising almost one-third of the total number of aircraft, was still the mainstay of civil government operations, but more Fairchilds and Bellancas were coming into use.

Forestry patrol

Forestry patrols for the Forest Service of the Department of the Interior now covered more than 92,000,000 acres in the three prairie provinces. From High River and the two landing grounds at Pincher Creek and Rocky Mountain House the Bow River, Crowsnest and Clearwater reserves, totalling 3,260,826 acres, were kept under observation, while a detachment at Grande Prairie continued to keep watch over a larger area of some 22,000,000 acres in the Peace River district. During 643 hours of flying in the 1930 season five fires were reported in the southern area, and 41 in the northern.

Winnipeg air station was responsible for 66,544,660 acres of forest, 44,468,480 of which were in Manitoba and the remainder in Saskatchewan. As in previous years the patrols were carried out from four sub-stations at Lac du Bonnet, Norway House, Cormorant Lake and Ladder Lake, and four detachments at Winnipegosis, Berens River, Thicket Portage and Lac la Ronge. "Vedettes" were used for detection patrols, with "Varunas" standing by for suppression and transportation flights when required. Towards the end of the season the new, more efficient "Vancouver" replaced the "Varuna". On nearly all patrols in 1930 a qualified fire ranger was carried in the "Vedette" with a "one-man pack" of fire-fighting tools and rations for 48 hours. Through this new system many incipient fires were nipped before they could spread, and in other cases the ranger was able to make an immediate assessment of what further assistance would be required. The fire hazard was high that year, more than 500 incidents being reported in the two provinces. Eighty-three of the 105 fires which occurred in the Saskatchewan forests were detected by the air patrols; no figure was reported for the 417 fires in Manitoba but the same ratio would probably apply.

Aerial photography

The number of photographic detachments was increased to eleven in 1930, each consisting of two officers, three or four

airmen and two aircraft. Most of the detachments had Fairchild seaplanes, either the Wasp engined FC2 or the new 71 type. Three detachments operating principally in the north-west flew "Vedette" flying-boats. More than 4200 hours were flown by the eleven P.D.s, of which 3420 were for photography and the balance for reconnaissance, transportation, air search, and forestry patrol during critical periods. The year's photographic coverage totalled 54,100 square miles, for which 98,275 photographs were required.

As usual one detachment was assigned to British Columbia where it was busy in the Nimpkish Lake, Barkley Sound and other areas of Vancouver Island, and around Sicamous, Quesnel and other points on the mainland. The detachment also took part in an extensive search for a civil pilot missing along the northwest coast of British Columbia, and flew some emergency forest fire patrols for the provincial government.

Five detachments were at work in central and northwestern Canada from Lake Nipigon to Great Slave Lake. The principal areas photographed by the peripatetic crews were Lake Nipigon and English River in Ontario, Porcupine Hills and Granville Lake in Manitoba, Dillon, Green Lake and Ile-à-la-Crosse in Saskatchewan, Lake Athabaska, Lac la Biche, and Lesser Slave Lake in Alberta, Resolution and Lockhart River in the North West Territories. In addition to these and numerous smaller photographic tasks, (11) the detachments also did some transportation and reconnaissance work for survey parties, and flew fire patrols for the Ontario Department of Lands and Forests.

In eastern Canada there were also five photographic detachments at work, principally in eastern Ontario and Quebec. One of these detachments, active only in the early part of the year, did photography for the Army's Geographical Section in areas along the shore of Lake Huron, Guelph, Rice Lake and Lachine. The other detachments, working for the various survey branches of the Department of the Interior, covered sections around Coral Rapids, Lake Nipissing, Algonquin Park and Orillia in Ontario, Calumet Island, Notastgan Lake, Blue Sea Lake and Mont Laurier in Quebec. One detachment, after photographing the north shore of the Gulf of St. Lawrence for the Hydrographic Surveys, moved into the maritimes for one major operation around Newcastle, N.B., and several smaller tasks in that province and Nova Scotia. These detachments also did some miscellaneous transportation and forest patrols in Ontario, Nova Scotia and New Brunswick.

At the beginning of the spring photographic season, F/O H.W.P. Carew and Sgt. A. Richards, of No. 2 Photographic Detachment from Winnipeg, were killed in the crash of a Fairchild at Regina. The crew were on their way to Dundurn forest reserve to carry out a photo operation when the accident occurred.

Flights to the Arctic coast

Highlights of the civil operations in 1930 were two flights to the mouth of the Mackenzie River which marked the first penetration by R.C.A.F. (or more accurately C.G.A.O.) aircraft to the Arctic coast of Canada. The first flight was undertaken by No. 1 General Purpose Detachment of Winnipeg air station, under the

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(11) The five P.D.s were assigned 37 photographic operations, several of which overlapped.

command of F/O J.C. Uhlman, to enable Col. Forde, director of the Royal Canadian Corps of Signals, and two officials from the Indian Affairs and Agriculture departments to carry out inspection visits along the Mackenzie. The party set out from McMurray on 2 July and flew down the river, making stops at Fitzgerald, Hay River, Fort Simpson, Fort Wrigley, Fort Norman, Arctic Red River and Aklavik. A flight was also made to Herschel Island in the Beaufort Sea. On the return flight up the river the detachment visited Fort Good Hope, Fort Norman, Hunter Bay, Fort Wrigley, Fort Simpson, Fort Providence, Fort Rae, Fort Reliance, Fort Resolution, Fitzzerald, Chipewyan and Stony Rapids before completing its itinerary at McMurray on 24 July. In a period of 20 days the two Fairchilds of the detachment flew 140.35 hours and covered 11,365 miles, most of which was entirely new ground to the R.C.A.F.

While this detachment was on its way down the Mackenzie a second party set out from Ottawa on an even longer flight to explore and photograph the main water and air routes in the North West Territories, and to inspect the R.C.A.F.'s gasoline and oil caches in that vast territory. The two aircraft, a Fairchild 71 and a "Vedette" flown by F/L F.J. Mawdesley and F/S H.J. Winny of No. 2 General Purpose detachment, (12) took off from the air station at Rockcliffe on 6 July and, staging through Lac du Bonnet and Ladder Lake, reached Fitzgerald on the afternoon of the 11th where the inspection flight began. From Fitzgerald the aircraft headed northwestward and flew down the Mackenzie to Aklavik where they landed on 19 July, a few days after Uhlman's party. An attempt was made to reach Herschel Island on the 21st, but fog forced the pilots to turn back when half-way to their objective. The next day the detachment left Aklavik and flew back up the Mackenzie, via Tent Island, Tenunuk and Arctic Red River, to Norman where it turned eastward to Hunter Bay on Great Bear Lake, landing there on 5 August. The aircraft then turned northward again, flying from Hunter Bay via Dease Bay to Coronation Gulf on the Arctic coast. Following the Coppermine River, the detachment flew south once more to Point Lake and thence to Reliance on Great Slave Lake (18 August). Backtracking to Lac de Gras, the headwater of the Coppermine, the crews spent several days there, photographing the water routes between Great Slave Lake and Coronation Gulf. On their return to Reliance they were detained a few days by bad weather until 2 September when the flight was resumed eastward across the Barren Lands, following the Thelon River to Baker Lake and Chesterfield Inlet (7 September). Turning north again, the detachment visited Cape Fullerton, Wager Bay and Repulse Bay to complete its long inspection itinerary. Returning to Chesterfield Inlet on 12 September, the two aircraft set out for home the next day, following the west coast of Hudson Bay to Churchill (21 September); en route stop-overs were made at Mistake Bay and Esquimo Point. From Churchill to Ottawa the flight was "merely routine". The long 12,000-mile flight was completed on 1 October when the Fairchild and "Vedette" touched down on the waters of the Ottawa River off Rockcliffe.

During the flight-the R.C.A.F.'s first penetration to the Arctic coasts of Canada - 3,100 photographs were taken and tests were made of various items of equipment designed for use in northern areas. Much of the flying was over unknown territory and unmapped routes where navigation was more dependent upon a "sixth sense" than upon sketchy, inaccurate maps or unreliable

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(12) In addition to the two pilots the party included a Dominion Land Surveyor, a corporal photographer, and two or three crewmen.

magnetic compasses. A member of the party recalls that even F/L Mawdesley, who seems to have had the navigational instinct of a homing pigeon, on one occasion became lost because of excessive and unknown compass variation. Hopefully he followed a river for some time until the dwindling fuel supply made it imperative to lose no more time in getting on course. Landing on the river, "Mawdy" went ashore, climbed to the top of a hill, surveyed the landscape and, with the help of his watch, estimated the correct direction to fly. Then he returned to the Fairchild and took off again but, to his crewman's surprise, headed in the opposite direction along the river. His instinct-or luck held, and he finally reached his destination "with scarcely enough fuel left to fill an eye-dropper."

Crop dusting

The Ford trimotor which had been purchased for dusting experiments in 1929 was not used in that role in 1930. The previous experiments had shown that an improved hopper was necessary, and although the A.E.D. did much work on the design the equipment was not ready for testing until late in the year. The work was delayed somewhat by diversion of the Ford to transport work at the time of the visit of the R.100.

In Manitoba wheat dusting experiments were resumed, after the interruption in 1929, using a Keystone "Puffer" flown by F/O P.B. Cox. Between 8 July and 14 August (when the grain matured) about 53 hours were spent on dusting and spore-trapping at MacDonald; more than 20 tons of sulphur were scattered over the fields. (13) At the conclusion of the experiments Dr. W.F. Hanna, the Senior Plant Pathologist at Winnipeg, reported that the tests carried out since 1927 showed that stem rust could be controlled by sulphur dusting, but ground dusting was equally effective and less expensive than aerial and the aerial experiments could therefore be discontinued unless a particularly severe epidemic broke out. He was anxious, however, to continue spore-trapping tests to study the fan-like spread of stem rust from southern Manitoba and Saskatchewan into Alberta. The Department of National Defence agreed to make these tests in conjunction with other operations at Winnipeg, Cormorant Lake and Regina in 1931.

Miscellaneous operations

The great bulk of civil government flying was done for the Forest Service and Topographical Survey branches of the Department of the Interior, but many other departments and bureaus also made use of the C.G.A.O. Directorate's services on a smaller scale. Some photography was done for the Dominion Water Power and Reclamation Service, the Geodetic Survey, and the North West Territories Branch of the Department of the Interior, for the Department of Public Works, and for the Department of National Defence. Transportation flights to carry personnel and supplies were made for various branches of the Department of the Interior, the departments

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(13) The pilot emphasized that a special type of goggles was necessary for this work. Dust entered the cockpit and the normal type of goggles could not keep it from the pilot's eyes. The dust was very painful and had such a weakening effect on the eyes that it was necessary to use cocaine drops "to be able to carry on."

of Mines, Marine and Fisheries, and Indian Affairs, the Royal Canadian Mounted Police, and the provincial governments of New Brunswick, Manitoba and Saskatchewan. For the Post Office Department an aerial survey was made of mail routes in western Canada, and, as already mentioned, wheat-dusting experiments were carried out for the Department of Agriculture and emergency forest fire patrols were flown for provincial governments.

Among these miscellaneous operations were several of special interest carried out in connection with the federal election in the summer of 1930. Aircraft of Winnipeg air station flew more than 90 hours to transport returning officers to polling places in northern Saskatchewan and Manitoba and to deliver and collect ballot boxes in the Melfort and Nelson electoral districts. Several mercy flights were also completed to assist sick or injured Indians and searches made for missing aircraft. A special transportation flight was also undertaken to carry Mr. A.E. Porsild and his equipment from Churchill to Tavani and Yathkyed Lake on the west coast of Hudson Bay so that he could investigate the feeding grounds of reindeer.

Bases and detachments

Under the C.G.A.O. Directorate there were the three air stations at Ottawa, Winnipeg and High River, (14) No. 1 Depot and the Photographic Section, both located in Ottawa, and eleven mobile photographic detachments. High River, with a strength of five officers and 20 airmen and six aircraft, used temporary landing and refuelling grounds at Pincher Creek and Rocky Mountain House, and a sub-base in northern Alberta at Grande Prairie. Winnipeg air station expanded still further during the year. Its strength rose to 28 officers and 119 airmen with a fleet of 44 aircraft, almost one-half the total number in the C.G.A.O. establishment. In addition to the four sub-stations at Lac du Bonnet, Norway House, Cormorant Lake and Ladder Lake, the four detachments at Winnipegosis, Berens River, Thicket Portage and Lac la Ronge, a dusting flight, a transportation flight, and a general purpose detachment, a new sub-station had been opened at Buffalo Park on the southwest bank of the Slave River about 5½ miles south of Fort Fitzgerald in northern Alberta.

Early in June 1930 it was decided that a sub-station was necessary in the vicinity of Fort Fitzgerald to support transport and photographic operations in the Northwest Territories and F/L C.R. Slemon, then in charge of No. 9 P.D., was instructed to make a reconnaissance of the area and select a suitable site. By 4 July the personnel of the sub-station (F/L Slemon and five airmen) had arrived at Fitzgerald by air, rail and boat and were soon fully occupied assisting the two general purpose detachments which used the sub-station as a base of supply. As no camp equipment was available until late in the season, the personnel were at first quartered in a hotel in Fitzgerald; then a small house was rented to serve as mess, offices and living quarters for the officers while the airmen lived in tents alongside. Construction of buildings at the site of the sub-station did not begin until late in September when a combined stores and office

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(14) Although Dartmouth was technically a C.G.A.O. station it had only a nucleus of personnel to assist aircraft engaged on photography or other operations in the maritimes.

building was erected by the Engineers. So that this building might be completed before winter set in, the personnel remained at Fitzgerald until the last boats for civilization left early in October. The aircraft and crews which had been based there during the summer took off for Winnipeg on 6 October but were so delayed en route by exceptionally bad weather that a week later they had only got as far as Cormorant Lake. Here winter came upon them, the lake froze over and the aircraft had to be left in the hangar there while the aircrews completed the journey to Winnipeg by rail. Their experience demonstrated once again that in those northern regions it was essential that aircraft should not remain later than the first of October if they were not to run the risk of being frozen in.

Ottawa air station at Rockcliffe had increased its strength to 17 officers and 68 airmen, its varied collection of aircraft to 21, and its flying time to almost 2400 hours, a rise of 40% over the previous year. The station included a general purpose detachment and a test flight.

D. Aeronautical Engineering Division

The Aeronautical Engineering Division was expanded in 1930 by the formation of a Test section in addition to the existing Research, Airworthiness and Inspection sections. The role of the new section was to prepare requisitions for tests, assist in the organization necessary to carry them out, maintain close liaison between headquarters and the test flight at Rockcliffe, and prepare and distribute reports on the tests.

Nine aircraft types were investigated by the Research section to determine their suitability for service use. They included the Vickers "Vancouver II", the Vickers "Vedette VI," with duralumin hull and enclosed cabin, the Fleet trainer, the de Havilland "Puss Moth" which was being considered for instrument flying training, and an RAF military type, the Westland "Wapiti" which was tested for winter flying operations.

There was also much experimental work on instruments used for "blind" flying, on floats and combination ski-wheel undercarriages, and on the design of an insecticide dust hopper for use in the Ford trimotor.

The Airworthiness section carried out stress analyses on 16 aircraft types that were to be built in Canada, in addition to strength and construction analyses of aircraft components such as floats and skis. The expansion of the Canadian aircraft industry led to the formation of a fifth Aeronautical Inspection Detachment at Vancouver early in 1930. The other A.I.D.s were located at Montreal, Ottawa, Toronto and Winnipeg.

Progress had been made on the construction of the National Research Council's wind tunnel, water channel and engine test bed which, it was expected, would be in operation early in 1931.

Chapter XV

The Royal Canadian Air Force in 1931

A. Parliament

The year 1931 marked the turn of the tide for the government air services. Since 1926, as Prime Minister Bennett pointed out in his budget speech to parliament on 1 June, the expenditure on the air services had risen steadily from $2,197,645 for 1926-27 to an estimated total of $7,151,163 for the last fiscal year (1930-31).(1) Now, under the dark cloud of the depression and the pressing need for retrenchment, the purse strings began to tighten and the estimates for the air services in the 1931-32 fiscal year were cut by more than $2,000,000.

This year the air estimates were divided into three main items for training, civil air operations, and air mail routes, totalling $5,142,000.(2) The first item of $2,266,000 for aviation training covered "all expenses in connection with the general maintenance of the air force, including training personnel for civil air operations and provision of necessary facilities therefor." The reduction of $244,000 in this vote, Defence Minister Sutherland explained, was because new aircraft purchases and new construction were being kept to a minimum. Since the Conservative government took office in August 1930 only 26 new aircraft had been purchased - 20 Fleet trainers and 6 Bellanca photographic machines. Development of the new air station at Trenton, which had already cost $180,000, would be limited in the current fiscal year mainly to completion of construction, already started, to the point where it would be protected against the weather, with some additional work for grading, drainage and installation of water supply.

One member expressed some concern about the "American" origin of the aircraft that had been purchased. He suggested there had been a change of government policy in this respect and asked why the minister did not continue the use of machines such as the "Moth" and the "Avian" that were manufactured by British corporations rather than "patronize to such an extent what are in reality American corporations."(3) Mr. Sutherland defended the purchase of the Fleet by pointing out that it cost only about $5000, one-third of the cost of a corresponding British aircraft, the "Tomtit", and that the material in the Fleet was over 50% Canadian.

The debate then turned to personnel. In answer to a member who asked why there was a reduction in personnel, forcing young men to leave Canada to find employment, the minister said that the proposed reduction was only eight officers and 23 airmen and that it was due principally to the fact that the forestry protection work in Manitoba, Saskatchewan and Alberta had been transferred,

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(1) Hansard, 1931 Session; Vol. II, p. 2147. The actual expenditure in 1930-31 came to $7,147,018.
(2) An increase of $180,000 in the air mail vote and another item of $10,000 for legal expenses in connection with aerial navigation (the appeal to Privy Council) brought the total estimates for the air services to $5,332,000.
(3) The Fleets were purchased from Fleet Aircraft Corporation at Fort Erie, Ont; and the Bellancas from Canadian Vickers in Montreal.

along with the natural resources, to the three provinces which now would make their own arrangements. During the discussion of this point Mr. Sutherland referred to the "phenomenal" number of applications received by the department for entry into the service, to which it had been necessary to reply that for the time being there was little chance of them being accepted. When a member suggested that the rush was due to unemployment, the minister did not agree. "They are not averse to obtaining a job, but I do not think that is the main reason. (It is) the fascination of the air for a young fellow. He sees a machine going through the air and he wants to be in it whereas in the old days he wanted to be an outlaw."(4)

The second item of $2,776,000 for civil air operations included "flying operations for civil government departments in connection with aerial photographic surveys, forestry patrols, forestry and grain pests, transportation, etc.; control of civil aviation; establishing aerodromes and airship bases; aeronautical engineering, etc." There was a major reduction of $1,289,000 in this item, due to general curtailment and in particular the discontinuance of forestry operations in the prairie provinces which resulted in the closing of some units and nine radio stations at Norway House, Winnipegosis, Berens River, Thicket Portage, Ile-à-la-Crosse, Prince Albert, Pelican Narrows, High River and Grande Prairie. The item was agreed to with little discussion.(5)

The third item in the air service estimates was $100,000 "to provide for expenses in connection with establishing and maintaining air mail routes; preparation and lighting of intermediate landing fields, etc." In the previous year $900,700 had been appropriated for this work and Mr. Sutherland admitted that, although there was some uncertainty about continuing the air mail service for the time being, the reduction of $800,700 might have been too drastic and a supplementary vote might be necessary.(6)

Although the total appropriation for air services in the 1931-32 fiscal year was $5,332,000, the actual expenditure ran well below that figure and at the end of the year there was a balance of $1,202,210 (approximately 23%) that had not been spent.(7) New aircraft purchases were suspended; most of the forestry patrol work was discontinued; wireless stations were closed; air mail services were decreased; the mooring-tower at St. Hubert was laid up; and as a result of all these economies the air services expenditure in 1931-32 totalled only $4,129,790, or $3,017,228 less than in the previous year. The "lean years" were beginning for the RCAF.

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(4) Hansard, 1931 Session; Vol. III, pp. 3111-14.
(5) Ibid.; Vol. III, pp. 3114-15.
(6) Ibid.; pp. 3115-17. The air mail appropriation was subsequently increased to $280,000.
(7) Most of the balance ($837,208) was in the civil aviation account, with $331,468 under training, and $33,533 in the air mail item.

B. Royal Canadian Air Force

Although retrenchment was beginning and the vote for the RCAF had been reduced by $244,000 (and actual expenditures by $407,500), the year witnessed some significant developments in the service. Its strength had not been materially affected, as yet, the reduction amounting to only 28, leaving 178 officers and 700 airmen on strength at 31 March 1932 against an authorized establishment of 204 officers and 732 airmen for the Permanent Force. On the other hand, the Reserve, for which provision had been made in the regulations of 1924, was now "in process of formation", the first appointments being gazetted in May 1931 when J.S. Scott and R.H. Mulock were made Honorary Air Commodores, W.A. Bishop an Honorary Group Captain, and D.R. MacLaren an Honorary Wing Commander.(1) The Reserve was to be inactive "except for such special courses as may be authorized".

Of more immediate significance was the opening of the new RCAF station at Trenton. Although the depression interrupted the development of the site (and gave a new lease of life to Camp Borden) sufficient work had been done by the late summer of 1931 to permit the transfer of some activities from the old training centre to the new station. The first personnel were transferred from Camp Borden to Trenton at the beginning of September(2) and in the weeks that followed the fighter ("Siskin") and army cooperation ("Atlas") flights were relocated there. F/L J.T. O'Brien-Saint was in command of the station for a few weeks until S/L H.W. Hewson arrived from Camp Borden to take over. In addition to "unit training" for its personnel (12 officers and 33 airmen at the end of the year) RCAF Station Trenton conducted flying training courses for air pilotage (navigation), advanced training, and flying instructors, and also introduced a junior officers administrative course.

RCAF Station Vancouver, with a small staff of four officers and 35 airmen under the command of S/L MacLeod,(3) was still engaged in seaplane training for service pilots and a few civilian pilots also; a seaplane flying instructors course was also given. There were the usual combined exercises with the Army and Navy and a few customs patrols as in previous year. An innovation in 1931 was the institution of pelagic seal patrols in which aircraft co-operated with HMCS "Vancouver" through April and May to protect the valuable fur-bearing seals against illegal hunting during their migratory run from southern waters to the "pupping" areas in the north Pacific.(4) Flying hours for the year exceeded

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(1) Prior to these appointments (all effective 1 April 1931) fifteen officers had been transferred to the RCAF Reserve upon termination of their service as Permanent or Non-Permanent members of the RCAF. The new appointments marked the beginning of a Non-Permanent Reserve List which subsequently, late in 1932, became the Reserve of Officers. By the outbreak of war in September 1939 there had been 258 appointments to the Reserve of Officers.

(2) See Weekly Orders (Serial No. 38) for 19 September 1931.

(3) On 28 December 1931 S/L A.B. Shearer succeeded MacLeod as commanding officer.

(4) The slaughter of female seals during the annual spring migration was causing considerable concern to Canadian and American conservation authorities. An agreement was made between the two governments to suppress hunting in Canadian waters in return for a share of the kill in the northern waters later in the summer. In 1958 it was proposed to again use RCAF aircraft on normal patrol operations off the Pacific coast to gather data on the pelagic seal migrations.

2100, the highest in the station's history up to that time.

Although Trenton had now been opened in execution of long-discussed plans to overcome "the unsatisfactory housing and living conditions" and "the poor condition of the aerodrome" at Camp Borden, the intervention of the depression delayed the development of the new station and Camp Borden carried on for some years longer as the major training centre and chief base of the RCAF. Except for the transfer of the two flights to Trenton in the autumn of 1931 Camp Borden's activities that year showed little change. "Unit training" was conducted for the station personnel of 30 officers and 239 airmen under the command of W/C Croil, in addition to various ground and air courses for service personnel posted there for training. Basic training was given to 70 airmen newly enlisted in the RCAF and advanced technical training to 37 other airmen. Technical training was also given during the summer months for 25 boys; this was the last year that such training was carried on. Since the inception of this technical training plan in 1927 more than 100 "boys" had received training at Camp Borden;(5) about 40 of them subsequently enlisted in the Permanent Force. Flying training courses for service personnel included courses for flying instructors, for navigation and instrument flying, and for "ab initio" officer and airmen pilots. For civilians there was one course for seven flying club instructors and another series of courses in air pilotage and instrument flying which were attended by 61 civilian pilots.

Flying training courses for airmen pilots were suspended for five years upon graduation of the fifth course at the end of May 1931. Since the start of this training early in 1927 thirty airmen had won their wings, four in 1927 (Sgts. A. Anderson, A.J. Horner, R. Marshall and E.C. Tennant), four in 1928 (Sgts. R.F. Gibb, G.T. Elliott, H.J. Winny and B.I. Barton), nine in 1929 (Sgts. G.V. Miscampbell, F.J. Ewart, R.W. Pike, R.I. Thomas, W.S. Tourgis, S. Volk, J.M. Ready, H. Cobb and G.E. Cherrington), nine in 1930 (Sgts. J.R. Bowker, H.A. MacDonald, A. Fleming, J.W. McNee, L.A. Harling, E.F. O'Connor, J.A.C. Collins, J.E. Doan and V.S. Roberts), and four in 1931 (Sgts. G.H. Desbiens, J.D. Hunter, N.E. Small and H. Bryant).

The P/P/O scheme in its original conception of three summers' training for university and RMC cadets also ceased with the 1931 course. There were 97 trainees in attendance that summer, 23 for their third term, 27 for their second and a new intake of 47 P/P/Os. All 23 members of the third term graduated in August, but as retrenchment rather than expansion was now the order of the day there was little opportunity for them to remain on duty with the Air Force and most of the new pilots were placed on the General List of the Reserve. Only one, J.L. Plant, was able to become a "career" member of the pre-war RCAF; he ultimately rose to air rank before his retirement in 1956. Several other members of this course later joined the Auxiliary, and others, like P.Y. Davoud winner of the Sword of Honour for his course, returned to the service during the Second World War.

In addition to the 23 graduates of the third term, two members of the second term, W.I. Clements and R.A. Cameron, also won their wings at Camp Borden in October 1931 by taking several

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(5) The total intake for the five summers was 174; - this figure includes many "repeaters" who returned for second or third terms.

weeks' additional training after the summer course ended. Although the other members of this group were unable to take their third term in the normal manner of previous courses, a good percentage of them did complete their training in later years, including D.S. Blaine, E.H. Evans, M.M. Hendrick, F.R. West and R.C. Procter, all of whom served with the Permanent Force. The suspension of the P/P/O scheme meant that the great majority of the new entry in 1931 received only the one summer's training. When ab initio training was later resumed (on a continuous one-year basis instead of three summer terms) ten members of this course returned to the service and won their flying badges; they were W.A. Orr and W.D. Woods (in 1933), S.S. Blanchard and D.M. Smith (in 1935), D.A.R. Bradshaw, G.P. Dunlop, N.B. Petersen and J.A. Verner (in 1936), and J.R. Frizzle and J.A.D.B. Richer (in 1938).

Since the inception of "ab initio" training in May 1923 the total intake for the nine courses had been 283 cadets (including 61 from RMC) and 97 won their wings before the plan ended in the autumn of 1931.(6) There were four fatalities in training.

In addition to various flying training courses, totalling over 11,400 hours (of which 4,060 were for civilian pilots) the RCAF did considerable exhibition flying (1376 hours) in 1931. Much of this was done during the Trans-Canada Air Pageant which toured the Dominion during the summer. For this pageant and for numerous other requests for exhibition flying a Siskin acrobatic team was again formed at Camp Borden early in the spring of 1931 and began intensive training, practising on an average four hours a day, weather permitting. The flight later moved to St. Hubert to complete its training and then joined the Trans-Canada Pageant. In addition to the five Siskins of the aerobatic team, flown by S/L H.W. Hewson, F/L W.I. Riddell, F/Os E.A. McNab, R.C. Hawtrey and F.M. Gobeil, the RCAF also provided its Ford trimotor and a Fairchild 71 to carry the servicing crews and some of the pageant officials. Starting at Hamilton on 1 July, the Trans-Canada Pageant visited the Border cities, Brandon, Regina, Moose Jaw, Calgary, Vancouver, Edmonton, North Battleford, Saskatoon, Winnipeg, Fort William, Montreal, Quebec, Saint John, Moncton, Sydney, Halifax and Charlottetown in the next two months. At each stop the Siskins presented an outstanding exhibition of aerobatics and formation flying. From the maritimes the team went to Cleveland, Ohio, to "steal the show" at the United States National Air Races, returned to Toronto for the Canadian National Exhibition, and concluded its long tour at London, Ont., on 12 September. Other flying exhibitions were presented at several centres in Ontario and British Columbia during the spring and summer by RCAF Fleets and Moths - and even a "Vedette".

The total flying by the RCAF during the fiscal year was 19,172 hours, an increase of almost 37% over the previous year. There were three fatal flying accidents involving the loss of four lives. On 28 September a Moth and an Avian flown by two civil pilots collided in the air at Camp Borden.(7) Both pilots took to their parachutes; one landed safely but Sgt. G.J. Hitchen jumped at too low a height to allow his parachute to open. A

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(6) Twenty-one more won their wings after 1931.
(7) The two pilots, members of a civilian navigation course, were appointed acting sergeants in the Non-Permanent while under training.

month later another member of the civilian navigation course was killed in the crash of a Fairchild 71 at Peterborough. F/L G.F.M. Apps, DFC was taking a group of trainees on a navigation exercise on 24 October when the aircraft struck a tree on take-off, lost flying speed and dived into the ground. Apps and Sgt. J.P. Hand were killed; three other airmen in the Fairchild survived. Mason Apps was one of the original members of the RCAF. Joining the service on 19 March 1924, a fortnight before its official birthday, he had served at Camp Borden and Winnipeg and with photographical detachments in the field before being posted to Calshot for an air pilotage course early in 1931. He had returned to Canada only a few months before his death. F/S A. Anderson, one of the first airmen to qualify as a pilot in 1927, lost his life in the crash of a Puss Moth while on a test flight at Ottawa on 21 March 1932; F/O A.L. James, the pilot of the aircraft, was seriously injured. The accident was due to structural failure, the left mainplane disintegrating and sending the aircraft spinning into the ground.

Drowning accidents took the lives of two airmen; another was killed in a motor car accident.

Eight officers attended courses abroad in 1931, at RAF Staff College (S/L G.E. Wait and F/L G.A. Mercer), Army Co-Operation School (S/L C.M. McEwen), Central Flying School (S/L L.R. Charron and F/L B.G. Carr-Harris), Air Pilotage Course (F/L G.F.M. Apps), and Royal Naval Staff College (S/L A.A. Leitch); a new addition to the list was the Imperial Defence College at which G/C Lindsay Gordon was the first RCAF student. S/L R.S. Grandy succeeded S/L Shearer as Liaison Officer at Air Ministry, and F/Ls E.G. Fullerton, W.E. Baker and A.J. Ashton went overseas on two years exchange to the RAF. F/L N.C. Olgilvie Forbes of the RAF, who had come out on exchange in 1929, had his term extended for another two-year tour and was joined by F/Ls J.A. Boret and R.W. Stewart.

For some years officers detailed to attend RAF Staff College had been given a three-month preparatory course at RMC, Kingston, during the latter part of a course conducted at the College for Army officers. Hitherto this training had touched but cursorily upon air force subjects, using outside lecturers. In 1931, however, S/L McEwen was attached to the staff at RMC, to give RCAF officers special instruction in air tactics, organization and other pertinent subjects.

Army services

Three RCAMC officers and twelve other ranks were detailed for medical attendance to RCAF personnel. In 1931 the number of RCCS personnel on duty with the Air Force, however, was reduced due to the reduction in forestry patrol in the western provinces which meant the closing down of all the wireless stations used in that work except the two at Winnipeg and Cormorant Lake. On the other hand, wireless facilities along the North West Territories and Yukon system, the Ottawa-Camp Borden-St. Hubert-Toronto system, and the air mail routes were extended. A light-weight portable wireless set had been produced with which RCAF photographic detachments working over the Belcher Islands in Hudson Bay were able to maintain contact with Ottawa, thus proving the practicability of such equipment for communication with isolated detachments operating in the northern hinterland.

The Engineer Services expanded $562,907 from RCAF and CGAO funds on construction work, most of the money ($422,750) being spent on the development of Trenton. Some additional land was acquired for that air station and 230 acres for the CGAO station at Lac du Bonnet to be developed as an airport for landplanes.(8)

(8) P.C. 1582 of 6 July 1931.

C. Civil Government Air Operations

1931 was a year of contraction in Civil Government Air Operations. The appropriation was cut from $4,065,000 for the 1930-31 fiscal year to $2,776,000 for 1931-32, while actual expenditures fell from $3,975,504 to $1,938,792 - a decrease of more than one-half.(1) Flying operations likewise were reduced, although not in the same ratio, the total hours dropping from almost 14,000 hours in 1930 to 11,185 in 1931. The decrease was due to the transfer of natural resources to the prairie provinces which meant the almost complete cessation of the extensive forest patrol work which the air service had been engaged in since 1920. As a result the air station at High River was placed on a care and maintenance basis on 1 April 1931; the sub-station at Norway House was closed and the four forestry detachments at Winnipegosis, Berens River, Thicket Portage and Lac la Ronge were also discontinued.(2)

The organization of the CGAO Directorate following these reductions consisted of headquarters in Ottawa, two air stations at Ottawa (Rockcliffe) and Winnipeg (with operational substations at Lac du Bonnet, Cormorant Lake, Ladder Lake and Buffalo Park, a detachment at Clear Lake, and three general purpose detachments), No. 1 Depot and the Photographic Section, both in Ottawa, and eleven photographic detachments in the field. Sixty-one aircraft were in service, a decrease of one third from the previous year; the "Viking" and "Varuna" had now been withdrawn and the Fairchild 71 was the major type in use although the "Vedette" was still going strong.

With the curtailment of forestry operations aerial photography became the primary civil task: 4821 hours (almost 44% of the total CGAO flying) were spent on this work. This represented an appreciable increase of more than 1300 hours over the previous year, and the area photographed rose to 76,000 square miles. The Department of the Interior was the major user of aerial photography to meet the requirements of its Topographical Survey, Geodetic Survey, Dominion Water Power and Hydrometric Service, North West Territories, National Parks, and Forest Service branches. Other departments which made use of CGAO services in this field were Mines (Geological Surveys), Public Works, Marine (Hydrographic Service), and National Defence (Geographical Section), and the provincial government of Nova Scotia. Of special significance were the photographic operations carried out this year in the North West Territories from Great Slave Lake to Great Bear Lake and along the Yellowknife and Thelon Rivers. The photographs were of great value in the preparation of air route maps for which there was a heavy demand due to the discovery of radium and silver near Great Bear Lake.

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(1) These figures include appropriations and expenditures for the Aeronautical Engineering Division and the Controller of Civil Aviation as well as the CGAO Directorate.

(2) In Saskatchewan forestry patrols were taken over by Brooks Airways Limited of Prince Albert which flew 583 hours under contract for the provincial government. In Manitoba Canadian Airways Limited, Western Lines, flew 456 hours on patrol from Lac du Bonnet, Gull Harbour and Cormorant Lake.

About three-quarters of the photographic work (3536 hours) was done by the eleven photographic detachments, and the remainder, except for a small amount done by Ottawa, was carried out by the units of Winnipeg air station. The detachments had, as usual, a staff of five men each (two pilots and three crewmen), with two aircraft, but whereas in the past both pilots had been officers this year six of the detachments had one NCO pilot and one officer pilot. Five detachments were equipped with Fairchild 71s, three with "Vedette", two with Fairchild FC2Ws, and one with Bellancas.(3)

As in previous years one PD worked in British Columbia, in the Quesnel area, Garibaldi Park, and northern Vancouver Island. Most of its operations were on behalf of the Geological Surveys Branch of the Department of Mines. On the eastern coast two detachments were active in New Brunswick and Nova Scotia, covering areas around Campbellton, Newcastle, Chipman and Shediac, Sherbrooke, Bridgewater, Halifax and the Annapolis valley. For the Hydrographic Service of the Department of Marine these detachments also photographed the north shore of the Gulf of St. Lawrence from Anticosti Island to the Strait of Belle Isle and the shoreline and islands of the Saint John River from Fredericton to Saint John. Other tasks in the maritimes included photography of the Cape Breton coal fields (for the Department of Mines), the Halifax-Truro highway (for the provincial government), Fort Louisburg (for the National Parks Branch), and reconnaissance over the Gaspe peninsula to investigate insect blight in the spruce forests.

Photographic operations in eastern Ontario and Quebec, on which five PDs were engaged at intervals, centred chiefly around Coral Rapids and Orillia in Ontario, and Oskelaneo and Ste. Agathe in Quebec. The aircraft were also used extensively for reconnaissance and transportation of triangulation parties of the Geodetic Survey that were working in the Oskelaneo area. A medical officer of the Department of Indian Affairs was given transportation on his rounds and some forest patrols were carried out in the same area for the International Paper Company.

Most of the photographic work in 1931 was in the Canadian hinterland in the vast territory from James Bay northwestward to Great Bear Lake for which the maps were blank or only vaguely sketched in. Five photographic detachments were engaged the whole season through in this area and two others spent part of their time there. The major operation was along the east coast of Hudson Bay and James Bay and in the Belcher Islands where parties of the Geological Survey branch of the Department of Mines and the Hydrographic Service of the Department of Marine were at work. In addition to photographing the Belcher Islands and the shore line from Moose River north to Little Whale River, the aircraft did much transport flying to ferry survey parties and supplies to and from the islands; a fortnightly mail delivery service was also provided for points along the east coast of the bays. Light-weight portable wireless sets were used on these operations and enabled the detachments based on Belcher Islands to maintain direct communication with headquarters in Ottawa.

In northwestern Ontario large areas were photographed around Nakina (1520 square miles), Lake Nipigon (2000), and Port Arthur (2300). In Manitoba the principal operation was at Nelson House

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(3) One PD was attached to Vancouver, five to Winnipeg and five to Ottawa.

(4000 square miles), and in Saskatchewan around Stony Rapids (5200) and Reindeer Lake (over 2500 square miles). One detachment which spent all its time in northern Alberta completed two large operations in the Peace River (2900 square miles) and Athabaska River (2000) districts. Farther north in the North West Territories another detachment flew 108 hours to take oblique photographs of a 14,000 square mile area in the vicinity of Great Bear Lake.

In addition to these major operations the detachments also completed numerous smaller photographic assignments and miscellaneous tasks of transportation and reconnaissance. Some of the photographic work was done in winter, including one major operation involving 108 hours of flying to cover 2750 square miles near Moose Lake and Ladder Lake in Saskatchewan for the Forest Service, and another operation to do 139 hours of reconnaissance over an area near Lake Nipigon for the Geodetic Surveys.

While the photographic detachments were engaged in these widespread operations other photographic crews from Winnipeg air station's bases were also at work, contributing 1231 hours to the year's total in this important phase. The areas which they covered were well dispersed over the map from the Manitoba-Ontario boundary, Riding Mountain Park and Banff Park in the south to Rankin Inlet, Great Slave Lake, Liard River, Great Bear Lake and Coppermine River in the North West Territories.

Transportation and reconnaissance constituted the second major CGAO activity in 1931 with a total of 3685 hours, or almost one-third of all the flying. Winnipeg and Ottawa shared about equally in this work with 1458 and 1550 hours respectively, while the photographic detachments, as indicated above, also did a considerable amount (677 hours). Much of the transport flying was in support of the photographic detachments to help them move from base to base and keep them supplied with film and other necessities. Seven departments of the federal government - Interior, Mines, Public Works, Marine, Agriculture, Indian Affairs, and National Defence - made use of CGAO aircraft for transportation, and flights were also provided for constables of the RCMP who were making the decennial census in northern Saskatchewan.

Surveys of air mail routes were carried out for the Post Office Department, chiefly in western Canada; wireless equipment was tested for the Royal Canadian Corps of Signals, and much instructional and practice flying was done.

Forestry patrol, once the major occupation of the CGAO Directorate, had now shrunk to a mere 320 hours. Although the natural resources had been transferred to the prairie provinces, the federal government retained national parks in Manitoba and Saskatchewan for which fire protection patrols were still necessary. To guard Riding Mountain Park in southern Manitoba, Winnipeg air station established a detachment on Clear Lake, and the sub-station at Ladder Lake made patrols over Prince Albert Park in Saskatchewan. The total area of the two parks was about 1,600,000 acres. The 320 hours flown on forest patrol over this area represented but a small fraction - less than 6% - of the time spent on this service the previous year.

Dusting operations for the Department of Agriculture were continued but on a much more reduced scale. Some spore - trapping flights were made in Manitoba and Saskatchewan using the sole - surviving Keystone "Puffer" and some other aircraft, but the most

interesting development was an experiment in mosquito control. Years earlier aircraft from Vancouver air station had been used to reconnoitre mosquito breeding areas in British Columbia; now the aircraft turned to attack of the winged pest. At the request of Mr. J.P. Tully of the Winnipeg Anti-Mosquito Campaign the "Puffer" was used in May and June to spray a mixture of paraffin oil and creosote - impregnated sawdust over swamp lands around the city in an experiment to see if the mosquito larvae could be killed.

Further tests were made at Ottawa to develop a satisfactory dust hopper for the Ford trimotor, but the agitator gear was not satisfactory and the tests had to be suspended when the aircraft was detailed for the trans-Canada Air Pageant. No wheat or forest dusting was done this year.

In September when a serious infestation of the white spruce sawfly appeared in the spruce forests of the Gaspe peninsula, the Department of Agriculture requested reconnaissance flights over the area to determine the extent of the blight. F/O F.M. Carter of No. 8 Photographic Detachment, then based at Chatham, N.B., was immediately instructed to make the flights and, accompanied by a timber investigator, he made several trips on 20 and 21 September over the area between the Matapedia and Cascapedia rivers. The Quebec Forest Industries Association Limited expressed its thanks for the directorate's co-operation in obtaining early and exact information about the outbreak which might cause serious losses in the forests. Dr. J.M. Swaine, the Associate Dominion Entomologist, added his appreciation of the prompt and thorough action taken on short notice and pointed out that "owing to the nature of the country it would have been quite impossible to obtain any considerable part of this information by ground work in time to be of use to us in planning next year's programme."(4) Ten hours flying had saved incalculable time, effort and expense.

Stations

On 31 March 1931 High River air station, under the temporary command of F/L G.R. Spradbrow with a staff of one officer and seven airmen, was closed and put on a care and maintenance basis under the supervision of Winnipeg air station. For ten years the station had been patrolling the forest reserves in the foothills of the Rockies from the North Saskatchewan River south to the international border, and more recently had extended that service into the Peace River district around Grande Prairie. That work was now suspended and High River became a storage place for aircraft until the Second World War brought a resurrection as an Elementary Flying Training School.

Winnipeg air station was also effected by the curtailment of forestry patrols. The sub-station at Norway House and the four forestry detachments at Winnipegosis, Berens River, Thicket Portage and Lac la Ronge were closed, and the flying time dropped 40% to a total of 3721 hours. The four substations at Lac du Bonnet, Cormorant Lake, Ladder Lake and Buffalo Park continued in operation, however; a new forestry detachment was established at Clear Lake, and there were also three general purpose detachments for transportation and other operations. These units were manned

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(4) Operation Order AC205/31 of 15 September 1931 and correspondence on file 1008-17-2, vol. 5.

by 25 officers and 104 airmen (including 11 NCO pilots) under the command of S/L N.R. Anderson. Twenty aircraft were in use, principally Bellancas, Fairchild 71s, and "Vedettes".

In contrast to Winnipeg, Ottawa air station was more active in 1931 than in earlier years. The flying time rose by more than one-third to 3226 hours, about half of which were on transportation and reconnaissance; much time was also spent on practice, instruction, and test flying. W/C A.E. Godfrey was in command at Rockcliffe with a staff of 16 officers and 76 airmen, two of whom were sergeant pilots. Because of its experimental and test work the station had a varied complement of aircraft, ten different types being represented in its collection of 19 machines.

Annual reports

The "Report on Civil Aviation and Civil Government Air Operations", which had been published annually by the Department of National Defence since 1923, was suspended after the 1931 issue. Through these years a brief summary of civil government air operations and civil aviation had been included in the general report (blue book) of the Department of National Defence, but the separate booklet giving a much more detailed treatment of the subject was a victim of the depression. Because of the reduction in the appropriations and the decrease in civil government air operations, the CGAO Directorate ceased as a distinct entity and later in 1932 was consolidated under the Senior Air Officer of the Royal Canadian Air Force. From 1932 on only the one all-inclusive departmental report was published.

D. Aeronautical Engineering

As no new types of aircraft were produced for the department in 1931 the research activities of the Aeronautical Engineering Division were chiefly concerned with the improvement and development of existing types. The metal-hulled "Vedette" was modified to provide greater comfort for the pilot and to incorporate many other minor details. The "Vancouver II" was also modified to take a camera mount and camera operator for use on medium long range oblique photographic operations. At the request of the RCAF de Havilland Aircraft of Canada Limited designed and built six "Puss Moths" that were specially adapted and fitted for blind or instrument flying instruction. Previously this instruction had been given in open cockpit aircraft that had one cockpit covered by a canvas hood; the movable hood device, however, remained in use on single-engined trainers through the Second World War.

Development work was also continued in cold weather lubrication, trimming gear for skis, fire extinguisher appliances for aircraft, and insecticide hoppers; and some study was given to the development of a special type of dual control to obviate the problem of pupils "freezing" to the controls.

The airworthiness section made stress analyses of nine types of aircraft manufactured in Canada, as well as items of equipment such as floats and skis. Early in 1932 an officer from this section attended a conference of Air Ministry and Dominion representatives convened in London to establish a common standard of airworthiness in the British Empire.

Chapter XVI

A. "The Big Cut" - 1932

In the history of the RCAF 1932 is remembered as the year of "the big cut" when its financial support was slashed and many of its personnel had to be released. For the fiscal year 1931-32 the appropriation had been reduced by more than $2,000,000, but this was a mere trifle when compared to the blow that fell the following year. For 1932-33 the estimates for the air service - the RCAF, CGAO, AED, Civil Aviation and air mail - was chopped to a mere $1,750,000, a sum comparable to that appropriated in the early years 1920 through 1925. Four years elapsed before the service again received the financial support it had enjoyed before "the big cut."

All three defence forces suffered from the financial restrictions made necessary by the depression, but it was the junior service that bore the brunt. The following table of appropriations for the three services through the fiscal years 1930-31 to 1932-33 shows how the axe fell.

Service	1930-31	1931-32	1932-33	Decrease from 1930
Militia Services	$11,087,800	$10,232,000	$8,850,588	$2,237,212
Naval Services	3,600,000	3,375,000	2,462,000	1,138,000
Air Services	7,475,700	5,442,000	1,750,000	5,725,700

That is to say, while the appropriation for the Militia was cut by slightly more than 20% between 1930 and 1932, the appropriation for the Air Services shrank by more than 75%. To survive under such conditions, the several branches of the Air Services had to effect drastic economies. These included: "the release of 78 officers, 100 airmen and 110 civilians; vacancies occurring during the year not being filled; curtailment of training in Canada and abroad; normal flying training of Provisional Pilot Officers discontinued; discontinuance of flying for other government departments, except where funds were provided by those departments; no new aircraft or engines purchased; bare maintenance charges only expended; reduction of Ladder Lake and Buffalo Park sub-stations to care and maintenance basis; suspension of construction at Trenton, etc; etc; intermediate aerodromes used for night flying in connection with air mail routes placed on care and maintenance basis; construction and improvement in civil airports suspended; cancellation of air mail contracts; reconditioned or used aircraft issued to flying clubs instead of new ones, etc; etc."(1)

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(1) National Defence Report 1932-33, p. 77.

Rumours of impending cuts in personnel were already circulating when parliament convened early in February 1932 and for several days Mr. Sutherland, the Minister of National Defence, was hard pressed by opposition critics led by Mr. Ralston who had held that portfolio in the previous Liberal administration. One attempt by Mr. Ralston to have the house discuss the dismissals as "a definite matter of urgent public importance" started a long argument over the correct parliamentary procedure and ended in the house voting to uphold the Speaker's ruling that Mr. Ralston's motion was not in order and that the question was not one of urgent public importance.(2)

Finally, on 26 February, Mr. Ralston was able to get the matter before the house. Mr. Sutherland declared that "every possible consideration" was being given to the officers and men who were to be released and described the leave with pay which they would receive. When Mr. Ralston questioned whether this was not "simply the ordinary, usual provision" and not "any special consideration in view of the summary and wholesale nature of the dismissals", the Minister agreed that it was just the usual leave.(3) Later in the day Mr. Ralston raised the subject once again and crossed swords with Mr. Sutherland in a sharp exchange. The Liberal member charged that the government had dismissed the men with "no thought to their usefulness in the development of Canada." The government's action was "poor business and..very short - sighted" and "in the interests of humanity, in the national interest and furthermore in the international interest" it should reconsider the matter.

The minister bridled at this attack which he denounced as "nothing but a piece of cheap party politics and an endeavour to make capital out of the troubles of a group of men who are in difficulties...." Part of the responsibility for their plight, he charged, rested on the shoulders of the previous government. The depression had started to show itself in the fall of 1929 and "surely prudence and reason would have dictated" that the estimates for 1930-31 should be reduced rather than increased by more than $1,500,000. If the Mackenzie King government had stopped the development of Trenton at that time, "a great deal of the trouble we are having at present would have been obviated." The only explanation of the increase in 1930, he said, was that an election was being held that year.

Defending the reduction in personnel, Mr. Sutherland denied that any contract was being broken or that the Air Force was being "badly used." If there was any part of the Department of National Defence the maintenance of which could not be justified when there was such widespread unemployment and distress, then that part must go. "That was the condition which made the cut imperative... If it were not for the absolute necessity for economy this would not have been done".

On a point of order Mr. Ralston asked that the imputations of the minister's phrase "cheap party politics" be withdrawn. The Speaker suggested that the words were unparliamentary and Mr. Sutherland bowed to his decision. After a little further wrangle over the matter the debate passed to other subjects.(4)

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(2) Hansard, 1932 Session; Vol. I, pp. 360-66. See also, ibid; pp. 307-8 and 434.
(3) Ibid.; pp. 558-59. Released officers were given one month's leave with pay for every five years of service (plus any annual leave due), and airmen received three week's leave with pay.
(4) Ibid.; pp. 595-99.

In the next two months a few more questions were asked about the RCAF,(5) but when the estimates came up in the closing days of the session they aroused relatively little discussion. Instead of two separate items as in previous years, the air estimates were lumped in one item of $1,750,000 to cover training, civil air operations, civil aviation, aeronautical engineering, and air mail routes. In explanation of the decrease of $3,602,000 in the vote the minister said that no new aircraft would be purchased, 188 personnel had been laid off, and civil air operations would be very largely restricted; in the current fiscal year he expected there would probably be about 5,000 or 6,000 hours as compared with 30,000 in the previous year.(6) Some of the released men had been taken into other branches of the service,(7) and the work they had been doing in the government air services would "to some extent fall into commercial aviation hands."

Mr. Ralston apparently was absent from the house when the item was passed and later in the day's sitting at his request Mr. Sutherland re-opened the discussion. The Liberal member wanted to know how the lump sum of $1,750,000 was to be apportioned to the various headings indicated in the item. The minister's reply indicated that the headings of the item were quite misleading. Although the vote was to include civil air operations, and various types such as aerial survey, forestry patrol, etc., were specifically mentioned, Mr. Sutherland said that these operations were "washed out altogether". The vote was to be divided between the RCAF ($1,555,000) and civil aviation ($195,000).(8) When Mr. Ralston pressed for further information about civil air operations, the minister said that some slight service might be done for other departments (as, for example Indian treaty money flights) if the other departments bore the out-of-pocket expenses. With respect to the use of the air force in the development of the north, the routes had been well surveyed and photographed and "the service will not suffer if it does not go on this year".

This statement did not satisfy Mr. Ralston who closed the discussion with a vigorous denunciation of the government's policy. Slashing the aviation vote in this manner, "without any regard to the work to be done", was wrong; if a cut had to be made it would have been better to cut the cadet vote. No satisfactory explanation had been given for the reduction in personnel, "the resulting tremendous dislocation in the air service, and the set back which this service, of which Canada was so proud, received by reason of the fact that these men were let go." After sketching the work which the air service had done in the past, he concluded: "I think the Canadian people believe a great mistake is now being made when they see that because we

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(5) See series of questions asked by Mr. T.F. Ahearn (Ottawa) on 29 February, 9 March, and 25 April about released personnel; Hansard, 1932 Session; Vol. I, pp. 612, and 947; Vol. II, p. 2314.
(6) Total RCAF flying in 1932-33 was actually 10,425 hours.
(7) "The government has done everything it can do, although it must be borne in mind that these men have really no greater claims than many others who have been let out of the service in other departments."
(8) The civil aviation share was subdivided: $77,000 for air mail route maintenance, $64,500 for control of civil aviation, $22,500 for St. Hubert aerodrome, and $31,000 for grants to clubs and schools of aviation.

are going through a period of depression this fine service is being completely demoralized."(9)

(9) Hansard, 1932 Session; Vol. III, p. 2983 (16 May); p.3191 (20 May); and pp. 3196-99 (20 May).

B. Royal Canadian Air Force

As the 1931-32 fiscal year drew to a close the strength of the RCAF was 178 officers and 700 airmen, against an authorized limited establishment of 204 officers and 732 airmen.(1) The drastic reduction of $3,602,000 in the air estimates for 1932-33 made it necessary to cut the strength of the force by one-fifth and on 31 March 1932, 78 officers and 100 airmen were released;(2) 110 civilian employees were also discharged. All the officers held Non-Permanent commissions, most of them having been appointed during the past three years when Civil Government Air Operations were expanding rapidly; only 27 had more than three years' service. Sixty-five were pilots; twelve came from the Stores branch, and one from the Technical. By rank, there were 9 flight lieutenants, 60 flying officers and 9 pilot officers. Most of the airmen were AC2's (32) or AC1's (43); twenty had gained their LAC badge and three wore corporal's hooks. Two sergeants who were included among the discharged men had been in the RCAF since its re-organization on 1 April 1924.(3)

These releases cut the strength of the RCAF to 100 officers and 600 airmen at the beginning of the new fiscal year. During the year the airmen strength was further reduced by several discharges (and no enlistments), but the officer strength rose slightly to give the force on 31 March 1933 a total of 103 officers and 591 airmen.

The reduction in the appropriation and the curtailment of civil operations necessitated a major reorganization and re-adjustment throughout the air services. The four-branch organization of RCAF, Civil Government Air Operations, Aeronautical Engineering, and Civil Aviation, which had been in effect since July 1927, was terminated on 1 November 1932 when, for greater economy and efficiency, the RCAF and CGAO directorates were once again consolidated, and the artificial distinction which had been made for the past five years between the military and civil air forces came to an end. Instead of two Directors, one responsible to the Chief of the General Staff and the other to the Deputy Minister, there was now one Senior Air Officer for the reunited service, responsible to the Chief of the General

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(1) The establishment allotted 113 officers and 390 airmen to the RCAF, 78 officers and 332 airmen to CGAO, 10 officers and 10 airmen to AED, and 3 officers to CCA (Weekly Order 101/29.)
(2) Eight of the officers were later appointed to the Permanent Force, including four who ultimately rose to air rank.
(3) Releases by units were:

Unit	Officers	Airmen	Total
RCAF Headquarters	3	6	9
No. 1 Depot	3	5	8
Photographic Section		3	3
Ottawa	11	17	28
Trenton	8	5	13
Camp Borden	28	44	72
Winnipeg	22	14	36
Vancouver	3	6	9
		100	178

Staff. The technical stores and equipment sections of the RCAF and CGAO were also consolidated under the Chief Aeronautical Engineer (effective 1 October 1932), and that branch was placed under the Senior Air Officer.(4) The Controller of Civil Aviation branch was not affected by this reorganization and consolidation; it retained its separate entity under the Deputy Minister.

The new organization of RCAF Headquarters comprised three divisions - Air Staff (subdivided into Air Staff Duties and Air Operations), Air Personnel Staff (subdivided into Air Training and Air Personnel), and Aeronautical Engineering (subdivided into Supply, Development, and Inspection). S/L A.A.L. Cuffe, who had succeeded W/C Breadner as Acting Director of the RCAF on 30 April 1932, relinquished that post at the end of October, and G/C J. Lindsay Gordon became Senior Air Officer. W/C G.O. Johnson became Air Staff Officer with S/L G.V. Walsh in charge of Air Staff Duties and S/L L.F. Stevenson as Staff Officer for Air Operations. W/C N.R. Anderson was appointed Air Personnel Staff Officer, with S/L Harold Edwards as Staff Officer for Air Personnel and F/L R. Collis Assistant Staff Officer for Air Training. G/C Stedman remained as Chief Aeronautical Engineer; S/L S.G. Tackaberry was in charge of the Supply branch of his division, S/L A. Ferrier of Technical Development, and S/L R.J. Grant of Inspection.

The stations, sub-stations and detachments previously administered by the CGAO Directorate now returned to the RCAF and the "civil" title Air Station was replaced by RCAF Station.(5) The service now comprised five active stations (plus two on care and maintenance), two sub-bases (plus two on care and maintenance), four training schools, one service squadron, seven flights, twelve mobile detachments, a stores depot, and a photographic section:

No. 1 RCAF Depot, Ottawa
RCAF Photographic Section, Ottawa
RCAF Station Ottawa
-- Test and General Purpose Flights, and seven detachments.
RCAF Station Trenton
-- Army Co-Operation and Fighter Flights.
RCAF Station Camp Borden
-- Flying Training, Army Co-Operation, Air Armament and Bombing, and Technical Training Schools.
RCAF Station Winnipeg
-- Lac du Bonnet and Cormorant Lake sub-bases (plus Ladder Lake and Fitzgerald on care and maintenance), three General Purpose Flights, and three detachments.
RCAF Station Vancouver
-- No. 4 (Flying Boat) Squadron, (6) and two detachments.
RCAF Station Dartmouth (on care and maintenance)
RCAF Station High River (on care and maintenance)

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(4) General Order 149/32 (AFGO 1/33) and General Order 22/23 (AFGO 27/33).
(5) The change in designation at Ottawa and Winnipeg did not take place until March 1933.
(6) At this time the squadron apparently existed only as a name; it did not actually come into existence until the spring of 1934.

W/C A.E. Godfrey was commanding officer at Ottawa; W/C L.S. Breadner at Trenton, S/L E.L. MacLeod at Winnipeg, and S/L A.B. Shearer at Vancouver. W/C G.M. Croil, who had been in command of RCAF Station Camp Borden since December 1927, went overseas to Imperial Defence College at the close of 1932 and was succeeded by W/C A.A.L. Cuffe.

Non-Permanent and Reserve

Although the organization of the RCAF as laid down in the King's Regulations and Orders of 1924 had included both a Non-Permanent Active Air Force and a Reserve Air Force, little had been done to form such components prior to 1932. Since 1924 an establishment of 67 officers and 130 airmen had been authorized for the NPAAF,(7) but the only appointments to it had been officers who were employed on full-time service with the RCAF, most of them being engaged on civil government operations.(8) No NPAAF units had been formed, nor was there any Non-Permanent training plan. In 1932, however, tentative regulations were drawn up for the NPAAF, a new establishment of 128 officers and 624 airmen was approved, and the formation of four units was authorized effective 5 October 1932.(9) The units were to be No. 1 (Army Co-Operation) Wing and three Army Co-Operation squadrons. The wing was never formed, but the three squadrons did come into existence. No. 10 was localized at Toronto under the command of S/L G.S. O'Brian, AFC, No. 11 at Vancouver under S/L A.D. Bell-Irving, MC, and No. 12 at Winnipeg under S/L J.A. Sully, AFC. Formation of the three squadrons was a slow procedure at first and it was the spring of 1933 before they actually began to take shape and start ground training. Flying training began late in 1934.(10) The establishment of NPAAF units led to another innovation, the appointment of Air Staff Officers in some Military Districts to supervise and assist in the organization of the units and to advise the District Officer Commanding on Air Force matters. The first Air Staff Officer, S/L G.R. Howsam, MC was appointed to M.D.2 at Toronto on 1 January 1933. In later years ASOs were also appointed to MD10 at Winnipeg (1934), MD11 at Esquimalt (1935), MD4 at St. Johns, PQ (1936), and MD13 at Calgary (1937).

At the same time that the NPAAF was organized, action was taken to constitute a Reserve of Officers. In 1931 most of the Provisional Pilot Officers who had completed their training, and could not be absorbed in the contracting Permanent Force, were appointed as Pilot Officers on the General List of the Reserve. Subsequently tentative regulations for this component were prepared and the establishment of a Reserve of Officers was authorized effective 5 October 1932.(11) Officers who previously

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(7) GO 15/25. By GO 39/29 the number of officers was increased to 85; the airmen establishment remained unchanged.
(8) Boys enlisted for technical training during the summer months were enrolled in the NPAAF as were some civilian pilots appointed as acting sergeants while on training courses at Camp Borden.
(9) P.C. 2198 of 5 October 1932; GOs 147 and 148.
(10) Each NPAAF squadron had a small PAAF detachment attached to it - an officer to serve as adjutant and instructor, and a nucleus of airmen for orderly room, maintenance and instructional duties.
(11) PC 2198 and GO 147.

had been on the Reserve list were now reappointed to the Reserve of Officers as were 68 of the Non-Permanent officers who had been released in "the big cut" of March 1932.

Training

The departmental report for the 1932-33 fiscal year contained the statement that "....particular attention was given to questions and problems in relation to the air defence of Canada, and all air matters in connection with the Geneva Disarmament Conference."(12) For Canada such problems as air defence and air disarmament were at this time essentially academic. The RCAF was a training and civil government force rather than a military one trained and organized for air defence. Service units equipped for military operations did not exist except for a fighter flight and an army co-operation flight at Trenton (and a squadron name at Vancouver), and the only service aircraft were a few "Siskin" and "Atlas" machines, both obsolescent types.

Even training activities were sharply reduced now. Funds did not permit any major movements of personnel to training centres so that, in general, stations had to undertake whatever local training was possible with existing staff and equipment. The transfer of training work from Camp Borden to Trenton was suspended and the development of the latter station temporarily interrupted because of the financial restriction. Two courses were given at Trenton in advanced training and instrument flying with a total of 15 pupils. At Camp Borden there was a more varied and extensive training program, but the total number of trainees was only 101, including 68 officers, 21 airmen and 12 civilians. There were the usual courses in ab initio training, advanced training, refresher flying, air pilotage, instrument flying, night flying, flying instructors, army co-operation, and parachutes.

In lieu of the ab initio training scheme for P/P/Os that had been in operation from 1923 to 1931, whereby COTC cadets and RMC gentlemen cadets were trained for three successive summers, a new scheme was introduced in October 1932 under which candidates were appointed as temporary P/P/Os in the Non-Permanent and given an intensive eight-months (later one year) course to qualify for their wings. The first intake under this new scheme (3 October 1932) numbered 15, four of whom had previously completed one or two summer terms. Thirteen successfully completed the course and received their flying badges on 23 May 1933. Four of the graduates, D.S. Blaine, R.G. Briese, H.M. Carscallen and W.A. Orr, were then appointed flying officers in the PAAF; W.M. Murray joined one of the new NPAAF squadrons for a year before transferring to the Permanent Force. Of the other graduates, six were appointed pilot officers in the Reserve of Officers; G.G. Truscott joined the PAAF a year later, while two others received commissions in the RAF.

The sum total of all the flying training courses (including 1206 hours on the P/P/O scheme) was 3963 hours. In addition, 760 hours were flown on practice and 198 on exhibition, making a grand total of 4921 hours on "training". Service flying, including transportation in connection with the administration of units, serviceability tests of aircraft, and test and development

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(12) DND Report 1932-33, p. 42.

of aircraft and equipment, amounted to 1178 hours. For the Controller of Civil Aviation 665 hours were flown by the RCAF on transportation and servicing of aircraft. Aerial photography, transportation and test flights for the Militia took 140 hours, and Civil Government Air Operations accounted for 3521 hours.(13) The total of all RCAF flying in the 1932-33 year was 10,425 hours, or slightly more than one-third of the previous year's total.

The financial stringency also restricted training abroad. In previous years there had usually been eight to ten officers attending courses in the United Kingdom, but this year there were only two, F/L K.M. Guthrie at RAF Staff College, and F/L R.E. McBurney on the Army Co-Operation Course at Old Sarum. S/L T.A. Lawrence took over from S/L Grandy as Liaison Officer at the Air Ministry. The first airman sent to Britain for training was Sgt. J.D. Hunter who was detailed for a special course of instruction on the operation and maintenance of the automatic pilot.

This year witnessed the beginning of a trend that was to gain strength through the next seven years. With fewer opportunities now to join the Canadian air service some Canadians turned to the Royal Air Force, and the departmental report noted that six Canadians had been accepted by that service, four receiving permanent commissions, one a short service commission, and the other admission to the RAF College at Cranwell.

There were four deaths in the service during the fiscal year, only one of which was due to a flying accident. While engaged on formation flying practice at Trenton on 26 July 1932, two Siskins piloted by F/L H.W. Hewson and F/O F.M. Gobeil collided in the air. Gobeil made a successful parachute jump, but Hewson was killed in the crash of his fighter. A veteran of the Great War, Hewson had served in the Canadian Air Force in 1920 and then joined the RAF in 1921. Returning to Canada, he was again commissioned in the RCAF in March 1924 and was stationed at Camp Borden and at Air Force Headquarters, as Staff Officer for Operations and Intelligence, before serving a tour on exchange with the RAF from 1929 to 1931. He then led the "Siskin" aerobatic team in the Trans-Canada Air Pageant in 1931 and in October of that year was transferred to Trenton with the "Siskin" flight.

F/L L.R. Charron, another "charter" member of the RCAF in 1924, died at Camp Borden on 1 December 1932. A bomber pilot during the latter part of the war, Charron had been commissioned in the Canadian Air Force in 1920 and was engaged on forest patrol at Roberval through the summer of 1922. In the following year he was posted to Winnipeg where he was engaged on civil government air operations until early in 1930 when, for some months, he was stationed at St. Hubert while that aerodrome was being developed. In 1931 he took the Flying Instructors' Course at Wittering and then returned to instructional duties at Camp Borden.

Army Services

RCAMC personnel attached to the RCAF remained unchanged at three officers and 12 other ranks.

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(13) Civil Government Air Operations are described below.

Expenditures on construction and airfield development, which had risen to a peak of almost $1,000,000 in 1930 before contraction set in, were sharply reduced in 1932-33 to a total of only $62,813. The major item was $27,675 for the completion of some work at Trenton.

C. Civil Government Air Operations

Through the first ten months of 1932 - i.e. through the normal operational season - Civil Government Air Operations continued as a separate Directorate responsible to the Deputy Minister. Early in the year, following the practice in use for past years, the various government departments had submitted their requests for aerial services to the Inter-Departmental Committee on Civil Government Air Operations, and an extensive program was drafted to meet their requirements. The general reduction in estimates, however, necessitated by the prevailing economic distress, led the government to eliminate the separate item for civil government air operations and consolidate it in one general appropriation for the whole air service - RCAF, CGAO, aeronautical engineering, civil aviation, air mail and air routes. This vote of $1,750,000 was one-third of the amount allotted to the air services in the previous year, and none of it was specially earmarked for civil government air operations. As a result the program which had initially been planned for the year had to be abandoned, and only work of an urgent nature could be undertaken with the limited number of aircraft and personnel available and the financial assistance which the departments concerned could provide for the operating costs involved. On this limited scale some operations were carried out for the departments of the Interior, Post Office, Indian Affairs, Marine, Mines, National Defence, and Public Works, and for the National Research Council and the Royal Canadian Mounted Police.

The total flying for these departments and agencies was 3521 hours, less than one-third of the CGAO flying in 1931. Most of the work (2672 hours) was done by units based on or detached from Ottawa air station. Winnipeg, once the major centre for these operations, flew only 469 hours this year; Vancouver, however, was more active than it had been in civil work with a total of 371 hours, and Camp Borden contributed 9 hours.

The two tasks of aerial photography and forest patrol, which in earlier years had constituted the greater part of CGAO flying, were now the minor items in the program. Two detachments from Winnipeg air station based at Riding Mountain in Manitoba and Waskesiu in Saskatchewan during the periods of high fire hazard flew about 78 hours on patrol over the Riding Mountain and Prince Albert National Parks. Photographic operations totalled only 377 hours, most of the work being done by a photographic detachment at Vancouver on behalf of the Marine, Mines and Interior departments. A general purpose detachment from Ottawa completed some assignments in Ontario, Quebec, New Brunswick and Nova Scotia.

Transportation flying likewise was sharply curtailed this year, only 637 hours being logged in contrast to almost 3700 the previous year. The great reduction in photographic operations meant that there was little requirement for transport flying in support of the detachments, but there were numerous requests to convey personnel and supplies for other civil departments - CCA inspectors, Geological and Mines surveyors, Public Works and Marine inspectors, RCMP constables, etc. - particularly in the less accessible areas of the North West. There were also some mercy flights to aid sick or injured Indians and the annual Indian treaty money flight to points in Northern Ontario. Aircraft from Camp Borden made a search for some lighthouse keepers missing in Lake Erie. At Winnipeg the mosquito-spraying work, which had been started the previous year, had to be cancelled

because neither National Defence nor Agriculture had the funds to operate the aircraft. At the request of the local campaign manager, however, a "Moth" made some reconnaissance flights over the breeding areas, the necessary gasoline and oil being provided by the manager. An unusual item in the year's work was an operation involving seven hours flying at Cormorant Lake sub-station in September to obtain data on cosmic ray radiation for Dr. Milliken of the California Institute of Technology. A Fairchild aircraft was used on the two flights with a special supercharged engine capable of reaching an altitude of 15,000 to 20,000 feet.

An interesting sidelight on "devotion on duty" is given by a comment of the officer commanding a detachment working in the North West that summer:(1)

> "The personnel of the Detachment successfully overcame the temptation to participate in the mining and prospective activities of the Great Bear Lake area. With sensational finds of silver and other minerals being reported in the near vicinity and high grade samples common throughout the area, the urge is sometimes great to permit one's interests to be somewhat diverted from Service duties."

Greater love hath no airman than this, that he gave up a potential fortune for the sake of the service.

The major activity in 1932 was a new venture in Civil Government Air Operations in which aircraft joined with the Royal Canadian Mounted Police in a campaign against rum-running that was assuming alarming proportions on the coast. These RCMP preventive patrols accounted for 1697 hours, or almost one-half of all the CGAO flying. In earlier years some preventive patrols had been flown on the Pacific coast to suppress narcotics smuggling and illegal fishing; most of the action in the new campaign against "demon rum" was concentrated on the Atlantic coast. In May 1932 four RCMP detachments were formed, each consisting of two pilots and three airmen. The Pacific Detachment based at Vancouver flew about 118 hours on preventive patrols off the west coast of Vancouver Island. The other three, detached from Ottawa for operations in the maritimes, were much more active, recording a total of 1575 hours on patrol beats that extended from Rimouski along the Gulf and Atlantic coasts to the Bay of Fundy. The Gaspe Detachment was responsible for the sector from Rimouski to Miscou Island. The Shediac Detachment covered the area from Miscou to Cape North on Cape Breton Island (including Prince Edward Island in its beat) and also watched the New Brunswick coast along the Bay of Fundy. The Dartmouth Detachment patrolled the long Nova Scotia coastline from Cape North around to Amherst.

Although air mail services had been curtailed, the Air Force was more active in this field than it had been, and the 733 hours flown to carry the mail constituted the second most important item in the CGAO program. Much of this flying was on an experimental air mail service which the RCAF provided for the Imperial Economic Conference during its meeting in Ottawa in the summer of 1932.

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(1) F/L C.R. Slemon, o.c. No. 2 Photographic Detachment of Winnipeg Air Station.

When the estimates for 1932-33 were being considered the Post Office and National Defence departments were greatly concerned over the proposed suspension of some air mail services. The effects of this curtailment, it was pointed out, would be serious from both the civil and military point of view. The inter-city services had expanded to a point where the revenue would soon be sufficient to pay the cost of operation. The airways in western Ontario and the prairie provinces had been equipped for nightflying at very considerable expense during the last three years; this organization would now be disrupted, the lighting and radio systems dismantled, and the operating staff of the commercial companies disbanded and their services lost to Canada. Municipalities which had co-operated generously in the program of airfield development would react "most unfavourably" to this blow to investments they had made in good faith.(2) Furthermore, from the defence point of view "no activity of recent years has had more important results than the construction of our airways. On this we are dependent for the mobility of our Air Force for defence purposes." The progress made in establishing the main Canadian east-west airway had been "without cost to the military appropriations." The closing of Canadian air mail services might also open the way for the entrance of foreign interests. Finally, "the Air Force must look to commercial aviation to an ever increasing extent for the reserve of officers and men necessary to complete its ranks in time of emergency. In the operating staff of the Canadian companies, and especially in the trained night flying pilots and the mechanical staff operating the airways, there exists the finest material for this reserve. Every effort should be made to maintain it intact."(3)

Officers of the two departments recommended that additional funds be provided for certain routes, including an experimental service between Belle-Isle and Montreal during the two months that the Imperial Economic Conference was meeting in Ottawa. The Prime Minister then instructed that projects be prepared for four routes to be operated by the RCAF from Winnipeg to Pembina, Toronto to Detroit, Montreal to Albany (one way), and Belle-Isle to Montreal (during the Conference). Mr. Bennett emphasized the special need for economy at this time and said "that his idea in these services was to give the Air Force personnel an opportunity for additional training and experience in the air which would otherwise be very limited this year."(4)

At a meeting between the Chief of the General Staff (Major General A.G.L. McNaughton), the Assistant Deputy Postmaster General (Mr. P.T. Coolican), the Director CGAO (G/C Gordon) and the Controller of Civil Aviation (Mr. J.A. Wilson), on 31 March, it was agreed that the RCAF should carry on the summer service between Montreal and Belle Isle as an emergency measure, but that the other three services should be continued on contract; on the other hand, it was proposed that the RCAF should operate the winter air mail service from Quebec to Seven Islands and Anticosti and from Moncton to the Magdalen Islands. The total

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(2) Municipal and private sources had invested $4,300,000 in airports; while DND expenditure on air navigation facilities and intermediate aerodromes was only $600,000.
(3) Memorandum (unsigned), 24 March 1932; AFHQ file 409-1-4.
(4) The estimates allowed for only 5,000 hours flying in 1932-33 as compared with 29,000 the previous year.

cost of the services was estimated at $264,817, of which only $154,344 was available in appropriations; the Belle Isle experiment would cost $20,000.(5)

Details of the Belle Isle service were worked out in April and the British government was informed of the plan. The "Empress of Britain" crossed from Southampton to Belle Isle in about 3 days 16 hours and took 29 hours more to reach Quebec City, which meant that mail carried by the liner was not delivered in Montreal until 48 hours after the "Empress" had passed the strait. If the mail was transferred from the liner to an aircraft at the strait it could be landed at Montreal at least 24 hours in advance of its normal arrival, and similarly outbound mail could be despatched from Montreal by air 24 hours after the vessel sailed. Under the proposed experimental service a naval tender would meet the "Empress" as it entered the Strait of Belle Isle at dawn on its fourth day out, transfer 800 lbs. of mail and deliver them to a Bellanca seaplane waiting in the sheltered waters of Red Bay, 990 miles from Montreal. The plane would then fly the mail to Eskimo Point (Havre St. Pierre) on the north shore of the gulf, 604 miles below Montreal, where it would be transferred to a "Vancouver" flying-boat and carried to Rimouski on the south shore of the river, 330 miles from Montreal. Transferred once more to a Fairchild landplane, the mail would be flown to St. Hubert from the airport adjacent to the wharf at Rimouski, and thence to Ottawa. In this way the mail would be received in Montreal within four days of despatch from Southampton and in Ottawa an hour later. Two trial flights followed by four inward and four outward flights were scheduled. The types of aircraft available were "not the most suitable" for the experiment, but "funds cannot be provided for special purchases this year and therefore the equipment now in service must be used."

To carry out the operation a Belle Isle Detachment was organized on 20 June under the command of S/L R.S. Grandy with F/Ls J.L.E.A. de Niverville, N.C. Ogilvie Forbes and F.J. Mawdesley and a group of airmen, three of whom (Sgts. H. Bryant, F.J. Ewart and J.D. Hunter) were pilots. Two Bellancas were allotted for the Belle Isle-Havre St. Pierre section and two "Vancouvers" for the Havre St. Pierre - Rimouski route.(6) A trial flight was made on 28 June, preparatory to the official opening a fortnight later. An RCN minesweeper met the "Empress" at 0037 that morning opposite Red Bay and transferred 13 bags of mail (174 pounds) to the seaplane which took off at 0207 hours. Unfavourable weather forced the Bellanca to land at Bradore Bay after covering only 55 miles and the flight could not be resumed until 0500, with a loss of almost two hours. Thereafter, however, the flight was without incident, despite more bad weather between Havre St. Pierre and Rimouski. The mail reached St. Hubert at 1500 and Ottawa at 1645 that afternoon. The total flying time from Red Bay to Ottawa (1098 miles) was 11.05 hours, and the elapsed time 14.38 hours.

An outward trial flight that had been planned was cancelled due to the weather, and on 12 July the first scheduled trip between St. Hubert and Red Bay was flown with 317 pounds of mail,

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(5) The plan to have the RCAF operate the Quebec - Seven Islands - Anticosti and Moncton - Magdalen Islands winter services was later dropped when Canadian Airways agreed to carry mail to Seven Islands and other points.

(6) Operation Order A 320/32 (Code "Belle") of 18 June 1932 gave detailed instructions for the experiment.

most of which consisted of philatelic "first covers". Five days later, on the next westward voyage of the "Empress", 34 bags (800 pounds) of mail were transferred at Red Bay which relays of two aircraft delivered to Ottawa in 10.50 hours flying time. The mail included a letter from the King to the Governor General (the Earl of Bessborough) who sent a message of commendation to the RCAF. The next inward flight on 3 August brought an even heavier load of mail, 1000 pounds, which again necessitated the use of two aircraft. The flight from Red Bay to Ottawa was completed in 9.50 hours flying time. Prime Minister the Rt. Hon. Stanley Baldwin sent a telegram to the Minister of National Defence expressing, for his colleagues and himself, hearty congratulations to the RCAF "on the remarkable feat achieved in collaboration with the "Empress of Britain" in conveying the mail from Great Britain to Ottawa in 98 hours."

All the flights, however, were not so successful due to the vagaries of the weather, as the story of outward flight No. 7 will illustrate. The flight originated at St. Catharines where F/O J.D. Bryans picked up 40 pounds of mail on the afternoon of 6 August and flew it to St. Hubert.(7) Later that evening F/O E.A. McNab brought another load of 42 pounds from Ottawa, and on the morning of the 7th flew on to Rimouski with 18 bags of mail (314 pounds) in his Fairchild. As the weather had turned unfavourable, delaying the "Empress" on its passage down the St. Lawrence, the next leg of the flight was not started until 1225 when F/L Mawdesley set out on a "Vancouver" for Havre St. Pierre where he landed at 1445. Ten minutes later F/L Ogilvie Forbes was on his way to Red Bay on a Bellanca but, encountering fog en route, he was forced to land at St. Augustine about 100 miles short of his destination. The "Empress" too was making slow progress down the Gulf and was not expected to reach Red Bay until the morning of the 8th, so Ogilvie Forbes was instructed to stand by and, if the weather permitted, fly the mail to Red Bay as soon as possible after daybreak. But the fog did not clear until late morning, by which time it was too late to overtake the liner. The Bellanca accordingly returned to Havre St. Pierre so the mail could be sent to New York to connect with another ship. The weather again intervened. On the Havre St. Pierre - Rimouski leg, Mawdesley too was forced down by fog near Seven Islands; after a two-hour wait he tried again but could get no farther than Franquelin. There the mail was transferred to a steamer for delivery to the "Duchess of York" which sailed from Montreal on the 12th.

The experimental service between Red Bay and Ottawa ended on 17 August with flight No. 8; two additional flights which had been scheduled were cancelled. In addition to this special service for the Conference other air mail flights were made between Montreal and Rimouski to connect with "Empress" and "Duchess" liners. The St. Hubert Detachment which operated this service with Fairchild aircraft included F/L D.A. Harding, F/O E.A. McNab and Sgt. pilot J.R. Bowker.

When civil government operations were virtually finished for the season the CGAO Directorate was consolidated with the RCAF under the Senior Air Officer, on 1 November 1932, and the civil and military air forces were once again officially one service.

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(7) This flight originated at St. Catharines to carry mail from members of the Conference who were attending the official opening of the Welland Ship Canal.

D. Aeronautical Engineering Division

Although the Aeronautical Engineering Division was now re-incorporated in the RCAF and placed under the Senior Air Officer, it still retained its responsibilities to civil as well as service aviation. On the civil side, it issued Technical Memoranda and advised and assisted the Controller of Civil Aviation in the preparation of Technical Information Circulars. The memoranda dealt with matters of general information and recommended practice, while the circulars contained instructions to the aviation industry and private owners of aircraft. The AED also co-operated with the Controller of Civil Aviation in making structural analyses of aircraft and components built in Canada, and the Aircraft Inspection Detachments at Montreal, Ottawa, Toronto, Winnipeg and Vancouver worked with the local Civil Aviation Inspectors in maintaining a general technical supervision of the airworthiness of civil aircraft in their districts.

As a result of the Airworthiness Conference held in London in January 1932, between Air Ministry and Dominion representatives, at which F/O A.O. Adams represented the RCAF, an Empire Standard of Airworthiness was evolved to replace the British Standard. The adoption of a common standard throughout the British Empire marked an important step in the progress of aeronautical engineering which would be of considerable benefit to the aviation industry.(1)

On the service side the work of the Division was necessarily affected by the curtailment of funds which meant that no new aircraft were purchased and development was confined to modification of existing types to adapt them for different functions. Work was also done on the design and proving of accessories such as a standard seaplane mooring tackle, flying - boat beaching harness and skiplane handling trollies. For economy in photographic operations experiments were made with a tri-camera mount, synchronised to operate simultaneously, which could be installed in a single-engine cabin seaplane. Winter lubrication trials continued, including a 200-hour flight test program to prove the feasibility of using an oil in which viscosity was controlled by an oil cooler fitted with movable shutters and a bypass valve. Trials were completed of a dual control device incorporating a "limited strength" control column and releasable rudder controls, but the Board of Officers which examined it considered such a device undesirable because of the bad pyschological effect it might have on the pupil.

The Inspection Detachments continued their normal function of continuous supervision of service aircraft, co-operation with service repair shops and depots, and inspection of all technical aircraft stores delivered by contractors. Some of the detachments were also studying the effects of salt water and sea air on aircraft and the extent of corrosion; valuable lessons were learned about the best methods of protection.

As mentioned previously the supply branches of both the RCAF and CGAO were consolidated under the Chief Aeronautical Engineer

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(1) DND Report 1932-33; p. 49.

on 1 October 1932; this branch also took over the work of the publication section.(2)

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(2) The publication section had previously been included in the RCAF Intelligence Section which during the year was merged with the Army Intelligence Section.

Chapter XVII

The Royal Canadian Air Force in 1933

A. Parliament

Even the dark cloud of the depression had its silver lining, although at the time few were in a mood to discern or appreciate the gleam. As part of its program to alleviate distress throughout the country, the government formed National Defence Unemployment Relief Camps at 16 sites to give work to men on the development of airfields. Twelve of the camps were engaged on clearing and grading new landing-fields for a trans-Canada air route, seven in eastern Canada at Fredericton Junction and Upper Brockway in New Brunswick, Megantic and Bishop's Crossing in Quebec, and Gillies, Nakina and Wagaming in Ontario, and five on the Pacific coast at Yahk, Kitchener, Princeton, Salmo and Flood in British Columbia. The other four camps were engaged on the improvement of existing civil or military aerodromes at Saint John, N.B., Rockcliffe, Trenton and Lac du Bonnet. At Rockcliffe station improvements included the erection of new buildings as well as living quarters for relief personnel; at Trenton the seaplane base and adjacent area were being developed and foundations laid for new buildings; and at Lac du Bonnet the airfield was being graded. (1)

Although this work was of immediate or potential value to the RCAF the service received even less money for the 1933-34 fiscal year than it had for the previous year. The aviation estimate was $1,600,000 for the combined requirements of "Royal Canadian Air Force - all expenses in connection with the general maintenance of the air force, including training personnel for civil aviation, and provision of the necessary facilities therefor; also Civil Aviation - all expenses in connection with civil aviation, including the control of commercial and private flying, construction and maintenance of airways and aids to air navigation, airship bases and flying clubs, etc." This sum was subdivided $1,405,000 to the RCAF, and $195,000 to civil aviation. Subsequently the modest sum of $97,000 was appropriated for civil government air operations, making a total of $1,697,000 for aviation -- or $53,000 less than in 1932-33. The decrease, the minister told the House, was distributed throughout the various items of the vote and was made possible by the elimination of new aircraft purchases, a reduction in the amount of flying and therefore fewer major overhauls, and limitation of the new work being done at Trenton.

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(1) Hansard, 1932-33 Session; Vol III, p. 2462.

Debate on the item produced only one significant contribution by Mr. A. E. Ross, member for Kingston City, whose speech on the theme that "today the only useful expenditure for the defence of a country is upon the air force" was one of the very few expositions of air power and the problems of air defence presented in the Canadian parliament since 1919. After outlining the progress made in military aviation since the Great War, Mr. Ross referred to the development of gas warfare which he believed would be the great danger in the next war.

> "The attack will come from the air with bombs carrying these fatal substances I have mentioned, against which we have absolutely no protection. The only defence we have is in our air force....In any future war the attack will not be against the men at the front, but upon the undustrial areas, the defenceless men, women and children in the areas back of the lines.... Therefore I believe the house might well agree that the air service represents the most important part of the estimates for the Department of National Defence. I am not asking for an increased expenditure upon protection, but I do not believe the air defence should be crippled, and when we do vote moneys for defence the country and parliament should know wherein our true defence lies."

His speech aroused no comment. After a few questions about unemployment relief camps and other matters, the house became involved in a long wrangle over a case concerning the disposition of a deceased soldier's pay. When that argument subsided the aviation estimate was agreed to. (2)

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(2) Ibid.; Vol. III, pp. 3147 and 3395-98. Of 6½ columns of debate on the item, Mr. Ross's speech took 2½, other questions or comments 1½, and the deceased soldier's case almost 2½ columns.

B. The Royal Canadian Air Force

With only $1,502,000 available for its operations in 1933-34 (including $97,000 for civil government operations), the RCAF had $58,000 less than in the previous year and was still existing "on a shoe-string". As a result "only absolutely essential expenditures for maintenance and equipment were made; no new aircraft were purchased; and construction work, particularly at Trenton, was held up." (1) No new aircraft had been purchased since January 1931 and the great majority of those in the service were rapidly becoming obsolete. In March 1934 the RCAF had 184 aircraft of 15 different types. Of these, 19 were "service" or military aircraft, including nine "Siskin" fighters (a type that had been withdrawn from use in the RAF as obsolete), five "Atlas" army co-operation aircraft (also obsolete in the RAF), and five "Vancouver" flying-boats (originally a civil government type which had been modified for service use). For civil operations there were 83 aircraft -- 35 Fairchilds of several different models, 17 "Vedettes", 15 "Puss Moths", 12 Bellancas, 2 "Hawk Moths", 1 Ford trimotor, and 1 Keystone "Puffer", all of which were becoming out of date, although some were still suitable for civil work and others for training. The remaining 82 aircraft were training types, consisting chiefly of the obsolescent de Havilland "Moth", 56 of which were on hand for ab initio training. There were also 17 Fleets for ab initio training, 6 Avro "Tutors" for army co-operation training, two Hawker "Tomtits" for practice flying, and one Consolidated "Courier," an obsolete type used for air firing practice.

The necessity for economy prevented enlistments to replace wastage in the ranks with the result that the service contracted still further and was below requirements in both technical and non-technical personnel. At 31 March 1934 the strength of the PAAF was 106 officers and 586 airmen. The organization and distribution of strength was:

RCAF Headquarters, Ottawa Air Staff Division Air Personnel Staff Division Aeronautical Engineering Staff Division	23 officers, 46 airmen
RCAF Station Ottawa Test Flight General Purpose Flight seven mobile detachments	15 officers, 103 airmen
RCAF Station Trenton Fighter Flight Army Co-Operation Flight	13 officers, 71 airmen

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(1) DND Report 1933-34; p. 9.

RCAF Station Camp Borden Flying Training School Air Armament and Bombing School School of Army Co-Operation Technical Training School	27 officers, 179 airmen
RCAF Station Winnipeg General Purpose Flight, Winnipeg General Purpose Flight, Lac du Bonnet General Purpose Flight, Cormorant Lake four mobile detachments	8 officers, 70 airmen
RCAF Station Vancouver No. 4 (Flying-Boat) Squadron two mobile detachments	6 officers, 35 airmen
No. 1 RCAF Depot, Ottawa	3 officers, 65 airmen
RCAF Photographic Section, Ottawa	1 officer, 14 airmen
Detached (2)	10 officers, 3 airmen
(3)	
Total	106 officers, 586 airmen

The Non-Permanent Active Air Force was beginning to take shape; recruiting had been started for the three squadrons and by the end of the fiscal year the NPAAF had attained a strength of 26 officers and 8 airmen. No. 10 Squadron in Toronto, with 15 officers enrolled, had been alloted part of a building at 87 Richmond Street for squadron offices, lecture rooms and drill hall, and space at 67 Victoria Street for messes. No. 11 Squadron at Vancouver, with 5 officers and 8 airmen, was accommodated in the Beatty Street armouries, and No. 12 at Winnipeg, with 6 officers, was located in the Minto Street armouries. No aircraft were available for the three squadrons, except one airframe issued to No. 10 for rigging instruction. It was anticipated that in the 1934-35 fiscal year four light aircraft would be issued to each unit so they could begin flying training in the summer of 1934. The personnel of the NPAAF were reported to be of a high standard and keen.

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(2) On courses abroad - 3 officers; at District HQs and RMC - 3 officers and 2 airmen; with Controller of Civil Aviation - 2 officers; with NPAAF units - 1 officer; with other detachments - 1 officer and 1 airman.

(3) The stations at Dartmouth and High River and the sub-bases at Lac la Ronge, Ladder Lake and Fitzgerald were on care and maintenance.

The Reserve of Officers had grown to 200 at 31 March 1934. (4)

G/C Lindsay Gordon, who had been Senior Air Officer since 1 November 1932, relinquished this appointment on 31 May 1933 and was succeeded, in an acting capacity, by W/C G.O. Johnson until the end of the year when G/C G.M. Croil returned from Imperial Defence College. On 1 January 1934 Croil took over command of the Air Force and retained that post, as Senior Air Officer and Chief of the Air Staff, until May 1940. On relinquishing the office of SAO, Lindsay Gordon was seconded to the Army, on 1 June 1933, as District Officer Commanding M.D. 12 at Regina, with the temporary rank of Brigadier. He remained seconded to the Army for six years, serving two tours as D.O.C, first at Regina and then at Winnipeg, in a status that was unique in the history of both services.

Training

Although the limited appropriation still restricted the amount of training that could be done, the service logged about 1000 more hours than in the previous year. (5) There was a decided increase in the amount of time devoted to training civilian pilots, with well over 600 hours spent on categorization tests (6) and courses for club flying instructors, night flying, instrument and air pilotage training.

The most significant development was the new emphasis placed upon the service aspects of flying training. (7) The curtailment of civil government air operations made more officers and airmen available for such training and advantage was taken of every opportunity to arrange appropriate courses for them and for Army personnel. This emphasis was reflected in courses, given for the first time so far as records indicate, for squadron armament officers (5), air gunners (8 airmen), and armourers (6 airmen). The Army co-operation courses were attended by 22 officers, and a new course was introduced in January 1934 to train Militia officers as intelligence liaison officers and squadron artillery officers. Four Permanent Force Army officers attended the six-weeks course at Camp Borden (8 January to 19 February 1934).

In addition to these courses at Camp Borden individual and collective service training was also carried on at Trenton and Vancouver. At Trenton personnel of the fighter and army co-operation flights, and at Vancouver personnel of the coastal reconnaissance squadron were trained in their respective roles in accordance with syllabi based on those used in the Royal Air Force. This training took over 795 hours of flying.

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(4) Two Canadian candidates were accepted for permanent commissions in the Royal Air Force.

(5) 4922 hours in 1932-33; 5940 hours in 1933-34.

(6) Two "A.1" flying instructors from the RCAF were detailed to tour the Dominion by air to test and categorize flying club and commercial instructors, to ensure that only fully qualified instructors were teaching flying.

(7) The departmental annual report once again noted that "during the fiscal year particular attention was given to questions and problems in relation to the air defence of Canada." DND Report 1933-34; p. 75.

The expansion of service training was accompanied by an extension of wireless training. In the past wireless had been used primarily on civil government operations and the service had been operated by personnel of the Royal Canadian Corps of Signals. The introduction of wireless into service training and operations apparently began in 1933 with the arrival of F/L H.A.L.Pattison, an RAF officer on exchange, who was a signals specialist. (8) About the same time several signalmen from the RCCS were attached to the School of Army Co-Operation at Camp Borden and began installing available wireless equipment in the school's aircraft. One Army co-operation course in the spring of that year was able to make limited use of wireless during its training, and by August the work of installation was completed in all the aircraft so that the second Army co-operation course was able to carry out the same training syllabus as that of the RAF. This included two-way radio-telephony for close reconnaissance and wireless telegraphy for artillery reconnaissance. The equipment available at Camp Borden for this training was out-of-date, but orders were placed for new wireless material similar to that introduced in the RAF that year, and as soon as some of the new equipment was received in March 1934 the work of installing it in the "Atlas" aircraft of the Army Co-Operation flight began.

In addition to training pilots in the use of wireless for Army co-operation, the RCCS personnel attached to the RCAF were themselves trained in the installation of equipment in aircraft and the operation of ground stations. The RCAF at that time had no wireless mechanics of its own and to remedy this "major deficiency" in technical personnel the program for 1934-35 included the enlistment and training of a number of men in this trade.

There was little ab initio flying training this year (484 hours). When the P/P/O course which had started in October 1932 terminated in May 1933 with the graduation of 13 pilots, such training was suspended temporarily pending consideration of a new policy under which pilot trainees would be appointed as pilot officers (provisional) for continuous training for one year. This scheme was introduced in June 1934. Other types of training, however, continued with courses at Camp Borden for flying instructors, air pilotage, advanced flying and instrument flying. Seaplane conversion training, hitherto given at Vancouver, was now conducted at Ottawa (Rockcliffe), which also gave courses in advanced photographic flying and camera operation to prepare eight officers and 14 airmen for civil operations.

In addition to the various training courses there was considerable practice flying (1126 hours) at the various stations. General List officers who were not employed on flying duties "kept their hand in" by making practice flights whenever possible, but such opportunities were very few as they were, in theory at least, limited to four hours a year on the little "Moth". (9) An interesting innovation this year

(8) On arrival in Canada in May 1933, Pattison was posted to Camp Borden for seven months and then returned to Headquarters to become Assistant Staff Officer Air Operations (A.O.3) in charge of organizing the RCAF's signals service.

(9) Statement by A/V/M F.G. Wait, April 1957.

was the granting of permission to RCAMC officers attached to RCAF stations (10) to fly as passengers or pupils under instruction so that they might become better acquainted with the physical and mental strain to which flying personnel were subjected. Several M.O.s took advantage of this authority to log nine hours in the air.

Exhibition or demonstration flying was quite limited, with only 93 hours on displays at Montreal, Rideau Ferry, Toronto and Hamilton, and a "Goodwill Tour" of Manitoba.

Training on courses abroad was still restricted by lack of funds. W/C Croil completed the course at Imperial Defence College late in 1933 and returned to Canada to become Senior Air Officer with a promotion in rank; and F/Ls J.L.E.A. de Niverville and AL. Morfee qualified for "p.s.a." at the RAF Staff College. Sgt.-pilot JD. Hunter had the distinction of being the first airman to attend a course abroad when he was detailed for an automatic pilot course given by the RAF in January 1933. F/Ls EJ. Mawdesley and HS. Ivey went to the RAF on exchange with F/Ls GH. Doveton and HAL. Pattison, only two officers being exchanged this year instead of the customary three. In an extension of training facilities at home one officer and an NCO took a short meteorological course at Toronto, and three airmen attended an engine course at the Ford factory.

Rifle Associations

During these years several Rifle Associations were formed in the RCAF. That keen-eyed marksmen were not lacking in the service was demonstrated in 1929 when AC2 P. Wilkinson became the first member of the RCAF to qualify for the Canadian Bisley team. Four years later Cpls BW. Beaumont and HL. Taylor from No. 4 (F.B.) Squadron at Vancouver did so well in the DCRA matches that they won places on the Canadian team which went to Bisley in 1934 and took both the Kolapore and MacKinnon matches.

C. Civil Government Air Operations

During the year a limited program was undertaken by the RCAF for civil government departments within the limits of the $97,000 appropriation, supplemented by whatever other work the departments concerned could finance from their own votes for out-of-pocket expenses. (11) Operations were carried out for the RCMP and for the departments of the Interior, Indian Affairs, Marine, Mines and Post Office on preventive service, photography, transportation, air mail and forest patrol. The total flying time was 3491 hours, about 31 hours less than the previous year. As in 1932 the greater part of the work (almost 80%) was done by units based at or detached from Ottawa air station.

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(10) Three officers and 11 other ranks of the RCAMC were detached for duty with the RCAF.

(11) The Inter-Departmental Committee on civil government air operations proposed, at its meeting on 27 October 1932, that in future the Departments concerned should underwrite the flying done for them. AFHQ file 1008-17-2, Vol. 5.

The preventive service for the RCMP was once again the major civil task, accounting for 2094 hours, or 60% of the total flying time. There were five Mounted Police Detachments, one on the west coast and four on the east. No. 11 Detachment based at Bamfield on the west coast of Vancouver Island flew 144 hours on preventive patrol, while No. 8 at Shediac, No. 9 at Dartmouth and Sydney, No. 10 at Gaspe and No. 12 at Rimouski flew 1950 hours on patrol along the Atlantic coast from May to November. Radio stations at the five eastern bases were operated by the Royal Canadian Corps of Signals.

Photographic operations increased during the year, rising from 377 hours in 1932 to 586 hours in 1933 - but still only a mere fraction of what had been done in earlier years. No. 1 General Purpose Detachment of Vancouver air station was engaged on photographic work for the Department of Marine in the Queen Charlotte Islands, Vancouver Island and along the British Columbia coast. No. 2 General Purpose Detachment from Winnipeg did tasks for the Interior and Mines departments in northwestern Ontario and the North West Territories. No. 6 GP Detachment from Ottawa was active in northern Ontario and Quebec, while No. 7 worked along the Gulf of St. Lawrence and in the interior of Quebec, New Brunswick and Nova Scotia.

Transportation flying decreased by 200 hours to a total of 433 for the 1933-34 fiscal year. In western Canada No. 3 GP Detachment from Winnipeg and the General Purpose Flight at Lac du Bonnet provided miscellaneous services in the North West Territories and the Yukon for various departments, including an inspection flight for the RCMP Commissioner to visit his scattered posts. The General Purpose Flight at Ottawa and one of the GP Detachments there did similar work in eastern Canada; Indian Treaty Party No. 9 was conveyed on its annual trip to points in northern Ontario, and air mail routes were reconnoitred in the maritimes and Newfoundland.

There was also less air mail flying than in the previous year, but 276 hours were recorded by the special overseas mail detachment which carried mail between St. Hubert and Rimouski to connect with incoming and outgoing mail steamers.

On forest patrol 102 hours were flown by Nos. 4 and 5 Forestry Detachments from Winnipeg to protect the Riding Mountain and Prince Albert National Parks.

Other operations

In addition to these operations for other departments the RCAF did much flying (1332 hours) for the Department of National Defence, chiefly in the way of transportation. Most of this work was for the RCAF itself, in the administration of units, serviceability tests of aircraft and some test and development flying for aircraft and equipment. For the Controller of Civil Aviation branch there was also considerable transportation work, while Unemployment Relief Projects in British Columbia, Manitoba, Ontario and New Brunswick made further calls for transportation, photography and reconnaissance. For the Canadian Militia and the RCN there was also a small amount of flying, for photography,

transportation, and reconnaissance. At first glance it may seem surprising to see that Winnipeg flew 28½ hours on behalf of the RCN; the time was spent in a search for an RCNVR sailboat that was missing with its crew on Lake Winnipeg. The overturned boat was discovered and salvaged, but aerial reconnaissance of the shoreline found no trace of the four-man crew.

Summary of flying

In the fiscal year 1933-34 the RCAF flew 10,763 hours, some 300 more than in the previous year. Service flying and training constituted somewhat more than half of the total (5940 hours), operations for other departments accounted for about one-third (3491 hours), and operations for the Department of National Defence about one-eighth (1332 hours). There were no fatal flying accidents, the only casualty suffered by the service being an airman who was killed in the crash of a private aeroplane at Toronto.

D. Aeronautical Engineering

Although no new aircraft were purchased, the Vickers "Vancouver" civil type was adapted for service use and one aircraft was converted. Steady progress was made in the development of accessory equipment, particularly of types that were peculiar to Canadian requirements.

Winter flying problems were still the subject of much study in the division. Extended service trials were made of the lubrication system experimented with the previous year, as a result of which it was decided to fit oil coolers to radial-engined aircraft. Winter trials were also carried out on the automatic pilot without any serious difficulty being experienced. At the request of the Air Ministry winter trials were undertaken on a Hawker "Audax" with a Rolls Royce "Kestrel 1 B" liquid-cooled engine. Despite exceptionally severe weather little trouble was encountered in the operation of the aircraft. The National Research Council carried out wind tunnel experiments with skis to solve the problem of trimming in high speed flight, and the results of this research were applied successfully to a pair of RCAF skis used on the "Audax" to replace an RAF type which had developed minor failures.

In the winter of 1933-34 S/L R.S. Grandy and F/Ls E.G. Fullerton and R.E. McBurney were detailed to make a study of winter flying conditions at Camp Borden and submit recommendations. In their report they said that "serious deficiencies of our training aircraft" handicapped courses during the winter months, and that cockpit heaters, better designed windscreens and cockpits, warmer flying clothing, improved gauntlets and goggles were necessary. Tests were subsequently carried out with a Fleet trainer to make the cockpit more comfortable for winter flying. (12)

Aerial photography was another major field of research and development. As a result of some experiments in vertical photography using the automatic pilot, it was proposed to do further work in the 1934 season in conjunction with trials of a new vertical camera mount. The main feature of this mount was that the camera could be locked in a definite position in relation to the aircraft and "the rotation required for crab adjustment is definitely constrained to be normal to the optical axis." Experiments with a synchronised tri-camera mount were sufficiently successful to warrant manufacture of four improved mounts for service trials during the summer of 1933. These trials revealed one major weakness in that each camera was set independently by means of degree scales and inclinometers which meant the possibility of human error and also meant that the relative orientation of the three cameras could not be guaranteed to remain constant. An improved model was therefore designed for trial in the 1934 season.

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(12) AFHQ File 1008-1-10.

As a result of recommendations from personnel attending a photographic course at Ottawa, several aids to accurate pilotage were devised. The chief of these was a development of the familiar fore-and-aft level, consisting of a glass tube mounted on the instrument panel and connected by pitot tubing to a vessel about four feet behind the panel; for each degree of pitch the liquid in the glass tube moved about one-and-a-half inches, thus enabling the pilot to maintain a very accurate attitude in reasonably good weather. The same system was also being applied to the control of lateral level.

The airworthiness section, in addition to its normal routine activities, prepared data for the Empire Standard Handbook of Airworthiness Requirements, which was approaching completion.

The supply branch faced difficult problems during these years of financial restriction. Stocks of equipment were depleted as a result of the limitation on purchases between 1932 and 1934, and to meet the need for some items required for training and operations it was necessary to spend much time trying to repair equipment which had become unserviceable.

Engineer services

Construction expenditure sank to a low of $27,653.30, chiefly at Trenton, St. Hubert and Rockcliffe. On the other hand, numerous aerodrome sites were acquired or reserved for clearing and development under the unemployment relief scheme. Twenty-one sites were purchased -- four in New Brunswick, two in Quebec, nine in Ontario, one in Manitoba and five in British Columbia. Twenty-nine other sites were also acquired by transfer to the Dominion government or by reservation by the provinces -- 24 in Ontario, three in British Columbia, and one each in New Brunswick and Manitoba.

Chapter XVIII

The Royal Canadian Air Force 1934

A. Parliament

In 1934 the tide began to turn; economic conditions were improving, the air estimates started to rise again slowly and members of parliament showed greater interest in Air Force matters than they had in previous years. Two opposition members spoke out strongly in support of aviation. Mr. Ian Mackenzie, the member for Vancouver Centre, expressed a view that he was to advance again, in much stronger terms, a few years later when he was himself holding the defence portfolio: "If it is necessary to carry out a real defence policy for Canada in the future, I think that the air force will play a most prominent part in that policy." Mr. Ralston, a former Minister of National Defence, commended Canada's development of civil aviation and hoped that civil government work would be increased again. (1) On the government side Mr. W. W. Kennedy, member for Winnipeg South Centre, delivered a long and stirring address on "Canada's future in the air". He attacked the opposition's "negativism" and commended a speech by Defence Minister Sutherland (2) as"the first comprehensive outline of a national aviation policy expressed by any minister of the crown in Canada." Mr. Kennedy's theme that Canada was "on the Main Street of the heavens" was essentially concerned with commercial aviation, however, and he had little to say on the defence situation. (3)

The air estimates, presented to the House on 16 March 1934, quite early in the session, consisted of two items for the Royal Canadian Air Force and for civil aviation. The first item, for "expenses in connection with the general maintenance and training of the permanent and non-permanent active air force, and provision of facilities therefor", amounted to $1,805,000, an increase of $400,000 over the previous year. (4) Mr. Sutherland said that due to the decreases in recent years "there was not really enough money in the last vote to get the full benefit of the air force as we had it;" there was not enough money allotted for flying and the personnel "were grounded too much". More money was necessary for the service to operate. The transfer of training activities from Camp Borden to Trenton was being made "as fast as conditions warrant". In the previous year the only

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(1) Hansard, 1934 Session; Vol II, pp. 1529, 1543, 1550, (15 March 1934).

(2) Delivered in Toronto on 23 February 1934, the "silver jubilee" of flight in Canada.

(3) Hansard; Vol. III, pp. 3035-43.

(4) Only the aviation branch of the Defence Department received an increase; the votes for the Militia and Naval Services were decreased.

training done at Trenton was that of the fighter and army co-operation flights. In reply to questions from Mr. Ralston the minister said that no new aircraft had been purchased in recent years, but in 1934 it was proposed to spend about $80,000 on the purchase of six new aircraft suitable for advanced training The current aircraft strength of the RCAF was 191 machines, of which 99 were in active use, 34 more in immediate reserve, and 58 in reserve.

For "expenses in connection with the control of civil aviation, airways and airports, government and public airports and grants to airplane clubs" the sum asked was $187,000, a decrease (initially) of $8,000 from the previous year. The total vote was subdivided $74,359 for airways and airports, $60,851 for the Controller of Civil Aviation, $27,790 for St. Hubert aerodrome, and $24,000 for flying clubs and aviation schools. Mr. Ralston again took the opportunity to urge "that favourable consideration be given to an increase of activities in connection with civil aviation." This item aroused more discussion than the service estimate, but the members were chiefly concerned with the air mail services (the grant for which was included in the Post Office estimates). In reply to those who deplored the curtailment of these services, Mr. Sutherland said that the contract for the Montreal-Rimouski route had been cancelled purely for financial reasons - there wasn't enough money; but "on more mature consideration" in view of the importance of that service it had been decided to have the RCAF carry it on: ".....We had plenty of airplanes and plenty of pilots and.. they could do that work."(5)

Later in the session when a supplementary item for the RCAF was presented Mr. Woodsworth returned to his theme of earlier years and, referring to the United Kingdom's decision to build up its air forces, asked "if any commitments have been arrived at between this dominion and the motherland with regard to air defence." Prime Minister Bennett replied that there were no commitments, but there had been an exchange of officers and information between the RAF and RCAF. (6)

The supplementary estimates raised the total aviation appropriation for 1934-35 to $2,262,000, an increase of $565,000 over the previous year. The RCAF received $1,930,000 (an increase of $525,000), plus $120,000 for Civil Government Air Operations (an increase of $23,000), and civil aviation received $212,000 (an increase of $17,000).

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(5) Hansard, Vol. II, pp. 1553-60.

(6) Ibid., Vol. IV, pp. 4633-34.

B. RCAF - Organization and Training

With more money available, the RCAF was able to expand once more after the lean years of contraction. More personnel - 12 officers and 98 airmen - were added to its strength; "new" aircraft were acquired; construction at Trenton was advanced, Dartmouth was reopened and a new service squadron was "localized" there. The three original Non-Permanent squadrons began flying training, and two new units were authorized. Operations for other departments (including National Defence) increased by 300 hours over 1933-34, while service flying and training rose by 1390 hours. The total RCAF flying in 1934-34 was 12,467 hours as compared with 10,763 hours the previous year.

Aircraft

The aircraft situation was slightly improved by the purchase in November 1934 of ten "Atlas" aircraft from the Air Ministry at a nominal price. These were the first aircraft acquired by the force since January 1931, but they were not strictly speaking "new" as they had to be completely reconditioned before being put to use for Army co-operation training. Otherwise the aircraft situation remained unchanged except for the deletion of two types, the DH Moth 75 and Keystone "Puffer", which were declared obsolete in November 1934.

At the end of the year the RCAF had 166 aircraft on charge, most of them being types used for training or civil government operations, and all of them rapidly becoming obsolete. There were only 28 service, or military, aircraft - 15 "Atlas" two-seaters, 8 "Siskin" single - seater fighters (all at least four years old), and 5 "Vancouver" flying - boats which had been converted from civil to service use. The 68 training aircraft included 42 of the obsolescent DH Moth 60 type, 17 Fleets, 6 Avro 621 "Tutors", 2 "Tomtits" and a "Courier". For civil operations there were 70 aircraft, consisting of 32 Fairchilds, 16 "Vedettes", 12 Bellancas, 9 "Puss Moths", and one Ford trimotor.

Strength and organization

During the year the strength of the PAAF increased by just over 100, to reach a total of 118 officers and 676 airmen. The major increase was, of course, in airmen strength; seven airmen were discharged during the year, but 98 recruits were enlisted, 18 of whom were ex-airmen signing up for another term in the service. Among the recruits, were five wireless operators (four from the Royal Canadian Signals and one from the Royal Navy) who were enlisted to build up this new branch in the RCAF.

The reorganization, which had been taking place gradually since 1932 to put the force on an efficient service basis, was continued within the limitation of funds and personnel available. The major change in 1934 was the re-opening of Dartmouth air station to accommodate a new flying-boat squadron. Dartmouth had been on a care and maintenance basis since December 1927 for use during the operation season by detachments working in the maritimes. The recent expansion of these activities led to the reopening of Dartmouth in 1934 to establish a permanent station on the Atlantic coast "and thus obviate the necessity of aircraft engaged in the Maritime Preventive operations having to be brought back to Ottawa for winter storage and overhaul." (7) Repair and construction necessary to make the station fit for use was undertaken as an unemployment relief project. No.5 (Flying Boat) Squadron was officially formed on 16 April 1934, embracing the five MP Detachments (Nos 8 to 12) which were redesignated as the Shediac, Dartmouth, Gaspe, Sydney and Rimouski Detachments of the squadron. (8) Squadron headquarters apparently began to form at Halifax in the latter part of August and was officially "localized" at Dartmouth on 1 November. S/L Harold Edwards assumed command of No. 5 a few days later.

RCAF Station Winnipeg was reduced to one General Purpose flight, stationed at Lac du Bonnet sub-base, two Forestry Detachments and two mobile General Purpose Detachments. The sub-base at Cormorant Lake was put on care and maintenance, (9) and the wireless stations which the Royal Canadian Signals had operated there and at Norway House were closed.

Two mobile detachments previously based at RCAF Station Vancouver for photographic and preventive operations were deleted from the RCAF establishment. The station now accommodated only No. 4 (F.B.) Squadron which in September 1934 received two of the Vickers "Vancouver" flying-boats which had been converted for service use. After flight trials by the Test Flight at Ottawa the two flying-boats were ferried to Vancouver in September by S/L Stevenson, F/Ls Ashton and Pattison and crews, and were used through the winter months. The station's flying equipment suffered a severe blow when one of the hangars at Jericho Beach collapsed. About 1700 hours on 20 January 1935 heavy snow-fall began at Vancouver, reaching a depth of about 18 inches by midnight. Then the snow turned to rain and two hours later part of the hangar roof gave way under the excessive weight. Four aircraft - three Fairchilds and a "Vedette" - were severely damaged, three of them so badly that they had to be written off.

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(7) DND Report 1935, pp. 66-7.

(8) GO 73/34 and AFO 175/34. The five detachments had previously been attached to Ottawa air station.

(9) The sub-bases at Lac la Ronge and Fitzgerald were still on care and maintenance, but Ladder Lake was transferred to the Saskatchewan government in exchange for land in the Army training area at Dundurn (P.C. 1563 of 18 July 1934).

As a result of these changes the organization of the PAAF now included:

RCAF Headquarters

RCAF Station Ottawa

- Test and General Purpose Flights and two G.P. Detachments

RCAF Station Trenton

- Fighter and Army Co-Operation Flights

RCAF Station Camp Borden

- Flying Training, Air Armament and Bombing, Army Co-Operation, and Technical Training Schools

RCAF Station Winnipeg

- GP Flight (Lac du Bonnet), two Forestry and two G.P. Detachments

RCAF Station Vancouver

- No. 4 (F.B.) Squadron

RCAF Station Dartmouth

- No. 5 (F.B.) Squadron

No. 1 Aircraft Depot, Ottawa

RCAF Photographic Section, Ottawa

Non-Permanent

The NPAAF continued to expand; 13 officers and 261 airmen were added to the strength, giving it a total of 39 officers and 269 airmen at the end of the year. Two new squadrons were authorized on 1 September 1934, No. 15 (Fighter) and No. 18 (Bomber), both localized at Montreal. The three original squadrons at Toronto, Vancouver and Winnipeg had now developed to the stage where elementary flying training could be undertaken and they logged 487 hours in the air. Each of the squadrons was allotted four "Moths" for flying and one for rigging instruction.

Accommodation was always a problem for the Non-Permanent units. No. 10 at Toronto was handicapped by inadequate and separated quarters, the lectures and drill instruction being given in one building on Richmond Street, while the messes were in another building on Victoria Street. For flying instruction the aerodrome and hangar at Weston were leased at a nominal rental and squadron headquarters were moved there for the summer. No. 11 at Vancouver had temporary accommodation for its ground activities in the Horse Show Building at 1900 Georgia Street West, which was placed as its disposal by the commanding officer; use of the aerodrome and hangar space were provided at Vancouver City Airport. At Winnipeg No. 12 had adequate space in the Minto Armouries for ground training, messes, offices, etc., and by special arrangement with the Winnipeg Flying Club it was able to share hangar accommodation and the use of Stevenson Airport with the PF Flight of RCAF Station Winnipeg.

Although the PAAF and NPAAF were slowly growing - 25 officers and 351 airmen were taken on strength during the year - the expansion was but a small fraction of the number of applications submitted; about 4,000 inquiries were received concerning appointment or enlistment in the RCAF and RAF. Eight Canadian candidates were nominated and accepted for commissions in the RAF.

C. Operations

Civil government operations for other departments - Interior, Indian Affairs, Fisheries, Marine, Mines, Trade and Commerce, and the RCMP - increased about 8% during the year. The preventive service for the RCMP was still the major task accounting for 2047 hours, or about 55%, of the 3746 hours flown on civil operations. Five detachments of No. 5 Squadron based at Rimouski, Gaspe, Shediac, Sydney and Dartmouth from May to September logged 1829 hours on this work. Each of the detachments had a wireless station operated by the Royal Canadian Signals for communication between the bases and the RCMP. In addition to preventive patrols along the coast, the detachments also photographed the shoreline of the Bay of Chaleur for the Department of Marine, and searched for fishermen missing off Cape Canso. Two aircraft of the Shediac Detachment participated in the celebrations marking the 400th anniversary of the landing of Jacques Cartier in Canada. They met the S.S. "Champlain", bearing the French delegates, on its arrival off Wood Island on 24 August, circled around the vessel, dropping flowers of welcome, and escorted the liner for some time. Later the aircraft again circled over the tenders disembarking passengers from the ship at Charlottetown. As a result of these operations the newly reopened station at Dartmouth supplanted Ottawa and Winnipeg as the major centre of civil work; the 1867 hours flown by aircraft of No. 5 Squadron constituted one half of the total civil government flying.

On the Pacific coast an aircraft of No. 4 Squadron carried out preventive patrols (160 hours) off the west coast of Vancouver Island, and the General Purpose Flight at Ottawa also put in 58 hours on an inspection flight to points in Quebec and the maritimes in connection with the preventive service.

Aerial photography began to expand again after two years' drastic curtailment. The 1085 hours flown in 1934 were almost double the previous year's figure, and about 30% of the total civil work - but still far below the record of 4821 hours set in 1931. Nos. 2 and 3 General Purpose Detachments from Winnipeg did most of the photography (681 hours), their activities covering sections of northwestern Ontario, the Rice Lake and Gods Lake areas in Manitoba, and large tracts around Great Bear and Great Slave Lakes and the Nahanni River in the North West Territories. Nos. 6 and 7 GP Detachments based on Ottawa flew 388 hours to photograph areas around Peterborough and Haileybury in Ontario, along the west shore of James Bay, and around Eastmain River, Chibougamou and Kakabonga Lakes in Quebec. As mentioned above, No. 5 Squadron did a small amount of photography along the Bay of Chaleur.

During the year's photographic operations tests were made of three new items of equipment: infra-red film, recording barograph, and automatic pilot. Tests of infra-red photography were made to determine if its power to penetrate haze would be advantageous for aerial mapping. The speed of the emulsion then available, however, was too slow to permit good photography from the air with the short exposure that was necessary. Nevertheless,

in the expectation that emulsion speed would be improved, the possibility of using infra-red to differentiate topographical features was explored. As another aid to aerial photography a recording barograph was modified to synchronize with the camera and record graphically the height of the aircraft at the time of each exposure. In this way the scale of each photograph could be determined. Tests were also made with an automatic pilot on some vertical photographic operations for the General Staff Geographical Section to determine if flight lines could be traversed more accurately than when the aircraft was flown manually. Experimental flights over a well controlled area showed that the "tilt" could be kept within small limits.

Transportation flying - 475 hours, or slightly more than the previous year - included two Indian Treaty Party flights to points in northern Ontario and Manitoba, reconnaissance in Manitoba and Ontario for the Interior and Mines departments, and reconnaissance over forest fires in the vicinity of Campbellton for the New Brunswick provincial government. No. 4 Squadron at Vancouver provided transportation for a cameraman taking motion pictures of Victoria for the Department of Trade and Commerce. On search and rescue, flights were made to look for a civil aircraft missing north of Senneterre, P.Q., and to carry an injured man and a sick Indian to hospital in Winnipeg.

Forestry patrol was continued over the Riding Mountain and Prince Albert National Parks by two detachments from RCAF Station Winnipeg. Each detachment had one "Vedette" flying - boat in charge of an NCO pilot (Sgts JM. Ready and GV Miscampbell). The total flying time was 139 hours, divided into two periods in May - June and August - September.

Operations for the Department of National Defence totalled 1390 hours, a slight increase over the previous year. Most of the flying (1003 hours) was on the RCAF's own requirements for the administration of units, serviceability tests of aircraft, and test and development of aircraft and equipment. Transportation was provided for personnel of the Controller of Civil Aviation branch of the department. For the Militia two photographic operations were done in the Niagara peninsula and around Fredericton, N.B. About 20 hours were flown on reconnaissance and transportation in Manitoba and British Columbia in connection with unemployment relief projects. Included in this time were several flights to drop supplies to relief camps in British Columbia which were isolated when floods stopped ground transportation. A heavy snowfall followed by rain on 20/21 January 1935 caused serious flooding in the river valleys. On the 26th RCAF Station Vancouver sent an aircraft to survey the damage around Flood and Hope and to ascertain the requirements of the relief camps in that area. Arrangements were then made to drop supplies at the camps on the display of blanket signals and on the 29th and 30th several missions were flown for that purpose along the Fraser valley.

D. Training

The major increase in RCAF activities during 1934-35 was in training which increased by almost one-quarter to 7331 hours, including - for the first time - flying training by the NPAAF squadrons. More and more emphasis was being placed on service training, both in the air and on the ground. In addition to squadron armament and air gunner courses, which had been started the previous year, there were explosives courses at five of the stations, a pistol course for officers and wireless courses for airmen at Camp Borden. An initial armament course was also given for six NPAAF officers. The School of Army Co-Operation at Camp Borden expanded its activities. In addition to the usual course for RCAF officers, it introduced courses for senior officers of the Permanent and Non-Permanent Active Militia. The courses, of three weeks duration, were designed to give the officers flying experience, instruction in writing orders for co-operation with aircraft, and in the control and use of such aircraft in war. (10) For junior officers a seven - weeks course was given in the duties of intelligence liaison officers and squadron artillery officers. Detachments from the school also attended Militia camps in the London and Toronto Military Districts to carry out exercises with Permanent and Non-Permanent units during summer training. The Army Co-Operation Flight at Trenton did similar training with Militia units at summer camp in the Kingston, Montreal and Quebec Military Districts. It also sent its pilots and air gunners to Camp Borden for armament training, including ground and air gunnery and bomb dropping.

Unit training in coastal reconnaissance work was carried out by No. 4 Squadron at Vancouver, using its two "Vancouver" flying-boats. All pilots qualified as first pilots on that type and carried out long navigation flights, including interception and radius of action problems and other exercises as laid down in the RAF syllabus. Due to lack of equipment, wireless and armament training had to be limited to ground instruction. The squadron also undertook co-operation training for militia units in the Victoria Military District. The Fighter Flight at Trenton carried out training in individual and flight tactics, and gave flying demonstrations at Toronto, Ottawa and other points.

In addition to service training there were numerous other courses given at the various stations, which included an engineer officers course, an inspection course (aircraft and engines), a stores course, and technical training for new recruits. At Ottawa, advanced photographic and camera operator courses were given to train personnel for civil operations. Flying training courses included the usual flying instructors, instrument flying, night flying, air pilotage and seaplane conversion course. Ab initio flying training was also resumed with an intake of 12 P/P/Os who began training at Camp Borden on 14 June 1934.

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(10) The first course in December 1934 was attended by 10 Permanent senior officers, and the second in February 1935 by 14 Non-Permanent.

Ten of the twelve had previously had one or two summers' training under the old scheme; the other two had just graduated from RMC. Four dropped out early in the course, another transferred to the non-flying list in the Permanent Force, and one joined the RAF. The remaining six, E.H. Evans, M.M. Hendrick, C.W.E. Miles, D.G. Price, D.M. Smith and F.R. West, qualified for their pilot's flying badge on 28 May 1935 and received commissions in the Permanent Force as flying officers.

As mentioned previously, this year marked the beginning of flying training by the three original NPAAF squadrons, each of which had a PF detachment of one officer and six airmen to serve as instructors and to assist in the administration and maintenance of equipment. Owing to the limited amount of money available, paid training for the NPAAF was restricted to six days at local headquarters and the squadron aerodrome; 25 hours' flying was authorized for each officer. By the end of March 1935 No. 11 Squadron (Vancouver) logged 248.30 hours, No. 12 (Winnipeg) 119.25, and No. 10 (Toronto) 119.10 hours.

On courses abroad there were, as usual, two officers, F/Ls B.F. Johnson and E.E. Middleton, at RAF Staff College, and F/L C.B. Turner completed a specialist explosives course at RAF Station Altrincham. At home eight airmen received special instruction on engines at the manufacturers' plants, and an officer took a parachute course at Buffalo.

In addition to all this training for service personnel, the RCAF also did much training of civilian pilots, conducting courses for flying instructors, instrument, air pilotage and night flying, and radio beacon. The radio beacon course given at Ottawa was the first of its kind in Canada. Thirty-nine pupils attended these courses, and seven flying club instructors were given categorization tests. The total flying on these civilian courses, 1082 hours, was almost 15% of all the flying training done by the service.

There was one fatal flying accident in which Sgt - pilot V.S. Roberts was killed when a "Siskin" fighter disintegrated in the air over Camp Borden on 31 October 1934. The aircraft (#10) was one of the two original "Siskins" which had been sent out to Canada in 1926. Sgt Roberts had received his wings with the fourth airmen pilots' course in May 1930.

Signals

Further progress was made in the development of the signals branch in the RCAF, which had been started the previous year. As mentioned above, five wireless operators were enlisted; all aircraft of the School of Army Co-Operation at Camp Borden and the Army Co-Operation Flight at Trenton were fully equipped with wireless, and ground stations had been improvised using aircraft-type equipment. A standard panel-body truck was fitted out for the requirements of close reconnaissance, and from the

experience gained with this tender a special body was designed and constructed. Modern RAF equipment was purchased for two wireless tenders to be used as mobile stations for army co-operation work. On exercises with Militia units, demonstrations were given of the various forms of wireless communication for all types of reconnaissance used in army co-operation.

RAF "Fury" visit

In the summer of 1934 an aerobatic team of the Royal Air Force visited Eastern Canada to present spectacular demonstrations with Britain's latest fighter, the Hawker "Fury". The team, a flight of No. 1 Squadron, RAF, consisting of five officers and 12 airmen under the command of W/C GC. Pirie, MC, DFC, desembarked at Montreal on 18 June and, after assembling its five aircraft at St. Hubert, flew to Toronto to take part in the city's centennial celebrations. The detachment then made a good-will tour of western Ontario, presenting aerobatic displays at London, Kitchener, Hamilton, St. Catharines and Camp Borden. On 14 July a combined RAF - RCAF air show was held at RCAF Station Ottawa which, favoured by ideal weather, attracted 25,000 spectators. The net proceeds from this first "Air Force Day" were turned over the RCAF Benevolent Fund. After visiting Montreal and Quebec, the detachment returned to Britain on 27 July. Throughout the tour the RCAF's Ford trimotor was used to transport personnel and equipment. The aerobatic displays of the "Fury" aircraft were most impressive, and must have caused some heartburning in RCAF pilots who still had the obsolete "Siskin" as their front-line, and only, fighters.

Aerodrome development

Expenditure on construction from the RCAF votes was $39,988, the largest item being for Rockcliffe aerodrome ($10,540). Under the unemployment relief project the development of sites for a trans-Canada air route continued. New sites, or additional land, were acquired at Cambridge, Havelock and Upper Broadway in New Brunswick, Megantic in Quebec, Killaloe and Vermilion Bay in Ontario, Vivian in Manitoba, Coleman in Alberta, and Midway in British Columbia. Radio beacon sites were also acquired at Nakina, Emsdale, Dane and Kapuskasing in Ontario.

E. Aeronautical Engineering

Two Vickers "Vancouver" flying-boats, fitted with Wright R 975/E engines, were converted for service use in 1934 and, after flight trials by the Test Flight at Ottawa, they were flown to Vancouver and used by No. 4 Squadron through the winter. Two more airframes were then converted, incorporating some modifications as a result of experience gained with the first two. Armstrong Siddeley "Serval" engines were installed in the later conversions in the hope that the additional horsepower would produce an aircraft better adapted to service needs. In keeping with this policy of employing Empire products, a contract was arranged to install Armstrong Siddeley "Civet" engines in the Fleet trainer. The airframe was built in Canada, and the engine parts, manufactured in England, were assembled in Canada.

Winter flying research was concerned chiefly with lubrication, cockpit comfort and skis. On successful conclusion of the service trials of winter lubricating oils, a technical memorandum was issued explaining the use of light-oils for winter operations. Experiments carried out with a Fleet trainer and an Avro "Tutor" indicated that in open cockpit aircraft adequate comfort in winter could only be obtained by completely enclosing the cockpit with some form of transparent draft-proof cover. This presented a problem of constructing such a cover of reasonable weight and cost which would at the same time permit easy egress in case of accident. A cockpit cover for the "Tutor" was designed and submitted to service trials.

As a result of wind tunnel experiments conducted by the National Research Council to develop a shape of aircraft ski which would offer minimum resistance to the air and minimum tendency to deflect from its chosen attitude, a satisfactory model was evolved, and No. 1 Aircraft Depot then built a fullsized pair. The design embodied a completely new internal device for trimming the skis in flight which made use of the elastic properties of the shock-absorbing ski pedestal to lock the skis in the correct attitude in the air and unlock them on the ground where free movement was essential. Some preliminary flying tests on the Hawker "Audax", on loan from the Air Ministry, indicated that the new skis were a considerable improvement over types previously used and that the new trimming device would be successful. Winter trials of the "Audax" were continued to determine its efficacy as an army co-operation aircraft in extremely cold weather.

The triple-camera mount was also given further service trials, using three of the 1934 model and four of the 1933 model which had been modified to embody the more significant features of the later model. Experience with these camera mounts showed that, although they were a definite advance over earlier designs, there was still some relative movement between the three cameras. The design of a 1935 model was therefore undertaken to produce a simpler and stiffer set by reducing the functions of the mount;

the new model was designed solely for multi-oblique survey photography and was not adaptable for vertical photography with the central camera, nor for scenic obliques with the side cameras.

Although the supply situation was "slightly better" than in the previous year, stocks of equipment were further depleted as the limited funds available did not permit the purchase of some equipment required, other than the ten "Atlas" aircraft, and certain items which became worn out could not be replaced. The "lean years" were still having their effect.

Chapter XIX

The Royal Canadian Air Force in 1935

A. Parliament

On 17 November 1934 Mr. Sutherland relinquished the Defence portfolio which he had held for the past four years and assumed that of Pensions and National Health. The Hon. Grote Stirling then became Minister of National Defence for the last eleven months of the Bennett administration. When Parliament assembled in January 1935 the economic situation was much brighter and the National Defence estimates which were presented to the House of Commons proposed increases for all three services with the largest share, $700,000 out of the total increase of $881,741, being allotted to the RCAF. Mr. A.E. Ross, the member for Kingston City, in a long speech on defence policy questioned whether this increase was adequate. Returning to the theme he had championed in the 1933 session, Mr. Ross said "there is no question whatever that the air will be of greatest importance in future preparations." Referring to the aircraft situation revealed in the departmental report for 1933-34[1], he declared that "the present state of affairs is not satisfactory" and if Canada was to have an air force it should be properly equipped with modern types of aircraft.[2]

Some improvement in the situation was promised in the aviation estimates for 1935-36. As originally presented these estimates called for an appropriation of $3,000,000, an increase of one-third ($738,000) over the previous year. The major increase was in the RCAF item which rose by $700,000 to a total of $2,630,000. The Civil Government Air Operations item remained unchanged at $120,000, but the Civil Aviation vote was raised from $212,000 to $250,000. In reply to Mr. Ralston's comments on the "very substantial increase" in the RCAF item, Mr. Stirling explained that, because of the great rapidity of development in aviation, increases were necessary to keep the force up to date. The depression had deferred reorganization of the service, but "this year an attempt is being made to catch up some of the slack, to move a little further towards the attainment of the desirable quantity of machines and personnel which are required to put the Royal Canadian Air Force into its proper relation to the other defence forces in the country." Mr. Woodsworth sought to ascertain what was considered "the desirable air force that we should have in Canada", but the minister said that he could not give an answer as the plans would be modified from year to year. In detail of the immediate increases proposed Mr. Stirling told the House that 17 officers and 167 airmen would be added to the Permanent Force and that four fighters, seven bombers and ten trainers, of types not yet decided, would be purchased.

When the House turned to the Civil Aviation item[3] Mr. Woodsworth referred to the United Kingdom's decision to separate civil aviation from military and asked if the Canadian government planned to do likewise. Mr. Stirling replied that although civil aviation and the RCAF were under one minister they were "entirely separate" and no

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(1) "No new aircraft have been purchased since January 30, 1931, and those now in the service are rapidly becoming obsolete"; op. cit, p. 76.
(2) Hansard, 1935 Session; Vol II, pp. 1869-70.
(3) There was no debate recorded on the CGAO item.

other division was required here. An argument with Mr. Woodsworth ended with the minister reaffirming that he was not considering doing anything with civil aviation except leave it where it was.(4)

The main estimates were subsequently increased by supplementary estimates totalling $1,302,900. The RCAF received an additional $500,000 (total vote $3,130,000), CGAO $305,000 (total $425,000), and Civil Aviation $497,000 (total $747,900). These substantial increases raised the total aviation appropriation to $4,302,900, a sum almost double (90%) that for the previous year. Commenting on the supplementary estimates, Mr. Stirling said that the preventive service, which was now one of the principal CGAO activities, was under the RCMP and the Department of Justice refunded the actual flying costs while the RCAF supplied the aircraft and flying personnel. The additional civil aviation vote was necessitated by the increased use of aircraft, including radio direction beams, emergency landing fields, lighting equipment, and grants to flying clubs.(5)

Parliament was dissolved in August 1935 and in the general election on 14 October Mr. Bennett's Conservative party was overwhelmingly defeated. Mr. MacKenzie King returned to office as prime minister, for a record tenure that lasted thirteen years until his retirement in November 1948. In the new Liberal government the Hon. Ian A. Mackenzie was sworn in as Minister of National Defence on 23 October 1935.

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(4) Ibid.; Vol. III, pp. 2266-69. Mr. Ralston urged that an aircraft should be located at Halifax for the benefit of navigation during the winter months; the minister said the subject was under close observation.
(5) Ibid.; Vol. IV, pp. 4068-70.

B. RCAF Strength and Organization

In the debate on the aviation estimates Defence Minister Stirling told the House that it was proposed to aid 184 personnel and 21 aircraft to the strength of the RCAF. The supplementary estimates made possible an even greater expansion than had originally been indicated. By the end of the fiscal year the number of aircraft actually on hand had fallen to 154 with the deletion of twelve machines that had been written off or disposed of,(6) but offsetting this decrease were orders for 28 aircraft that had been placed during the year for delivery early in 1936. They included six reconditioned Westland "Wapiti" bombers, purchased from the Air Ministry, and four new Blackburn "Shark" torpedo-bombers. For training there were ten more Fleet ab initio trainers and three Avro 626 "Tutors", an advanced type used for army-co-operation training. For civil operations orders were placed for three Northrop "Deltas" and two Fairchild "Super 71s".

The size of the Permanent Force expanded by almost one-third in 1935. The number of officers in the PAAF increased by 24 and airmen by 208, giving it a total strength of 142 officers and 884 airmen - or more personnel than before the "big cut" in 1933. For the first time in its history the strength of the Permanent Force passed the 1,000 mark. As a result of the extensive publicity given to the expansion of the Royal Air Force there was a great increase in the number of applications received from Canadians for entry into that service or the RCAF, the total running to 9,000 for the year, more than double the number received the previous year. Thirty-seven Canadians were nominated and accepted for commissions in the RAF. The British service was taking on more Canadian officers than was the RCAF!

The growth of the RCAF was accompanied by a reorganization at headquarters and stations. Within the Air Staff Division at AFHQ a new Organization Branch was set up in July 1935, under F/L E.E. Middleton, to draft establishments for personnel, aircraft, motor transport vehicles and marine craft, and to deal "with matters concerning the present and future organization of the Force". At the same time an RCAF Signals Branch was also formed in Air Staff Division under F/L J.G.W. Weston (RAF) as Air Signals Adviser. The Aeronautical Engineering Division was expanded to include a Publications Branch.

The re-organization of the RCAF on service lines made further progress with the authorization of five more squadrons to join the two (Nos. 4 and 5) already existing at Vancouver and Dartmouth. At RCAF Station Ottawa the Test Flight, General Purpose Flight and two mobile detachments were amalgamated in the autumn of 1935 as No. 7 (General Purpose) Squadron. Similarly at Winnipeg No. 8 (G.P.) Squadron was formed from the various units (G.P. Flight, G.P. and Forestry Detachments) which formerly had comprised the Station. The other three squadrons were initially based at Trenton where they would form as rapidly as personnel became available from the various training courses. The nucleus army co-operation flight at that station was expanded into No. 2 (Army Co-Operation) Squadron by the addition of a headquarters and second flight; it was equipped with "Atlas" aircraft. For the new "Wapiti" aircraft (when they were received) No. 3 (Bomber) Squadron was authorized, consisting of

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(6) The deletions included one "Vancouver", wrecked in a storm at Jericho Beach in February 1936, two Fairchilds and nine "Puss Moths".

headquarters and one flight; the fighter ("Siskin") flight at Trenton was also a component of this squadron. Finally, a nucleus was set up for No. 6 (Torpedo Bomber) Squadron which would be equipped with the "Sharks" that were on order.

The training set-up was also re-organized with the formation of RCAF Training Group at Camp Borden, comprising Group Headquarters, Technical Training School, Air Armament School, Flying Training School, and Air Navigation and Seaplane School, a new unit existing only as an establishment. The School of Army Co-Operation, previously based at Camp Borden, moved to Trenton during the year.

Late in January 1936 the Photographic Section, which had been located in Ottawa for the past 16 years, moved to RCAF Station Ottawa (Rockcliffe) where it took possession of a new building which had been especially constructed for its use as an unemployment relief project. The section was then redesignated RCAF Photographic Establishment, still under the command of S/L E.R. Owen.(7)

Following these changes, the organization of the PAAF at 31 March 1936 was:(8)

R.C.A.F. Training Group, Camp Borden
- Group Headquarters
- Technical Training School
- Air Armament School
- Flying Training School
- Air Navigation and Seaplane School

R.C.A.F. Station Ottawa
- Station Headquarters
- No. 7 (G.P.) Squadron
- R.C.A.F Photographic Establishment

R.C.A.F. Station Trenton
- School of Army Co-Operation
- No. 2 (A.C.) Squadron (H.Q., and two flights)
- No. 3 (B.) Squadron (H.Q., bomber and fighter flights)
- No. 6 (T.B.) Squadron (one flight)

No. 4 (F.B.) Squadron, Vancouver

No. 5 (F.B.) Squadron, Dartmouth

No. 8 (G.P.) Squadron, Winnipeg
- General Purpose Flight, Lac du Bonnet

No. 1 Aircraft Depot, Ottawa

Non-Permanent Active Air Force

The NPAAF also expanded during the year by 13 officers and 20 airmen,(9) to reach a total strength of 52 officers and 289 airmen.

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(7) AFO 308/35 and 28/36.
(8) Camp Borden, Vancouver, Dartmouth and Winnipeg were no longer stations. High River station and the sub-bases at Cormorant Lake, Fitzgerald and Lac la Ronge, previously on care and maintenance, were now deleted from the organization.
(9) Although 131 airmen were enlisted, there were 111 discharges.

Two new squadrons were authorized, No. 19 (Bomber) at Hamilton on 15 May and No. 20 (Bomber) at Regina on 1 June 1935. The three original squadrons, Nos. 10, 11 and 12, were now well organized and actively engaged in training, logging 2171 hours during the year. The two Montreal squadrons, Nos. 15 and 18, were ready to begin preliminary training. On 15 April 1935 the Toronto squadron was officially redesignated No. 10 (City of Toronto) (Army Co-Operation) Squadron and thus became the first RCAF unit to acquire a civic distinction.

Construction

There was a great increase in expenditures by the Army Engineer Services on construction for the RCAF, the figure rising to almost $175,075, or more than four times as much as in the previous year. The largest item was for the development of Rockcliffe ($60,574). In addition to these expenditures from RCAF funds, there was much further work under the Public Works Construction Act at Rockcliffe, Dartmouth, St. Hubert and other airfields. Additional land was acquired for the expansion of the service fields at Dartmouth and Rockcliffe and the civil fields at Cambridge, N.B., and Coleman, Alta., and new sites for emergency landing fields on the trans-Canada airway were selected at Stanley, N.S., Windsor Mills, P.Q., Pendleton, Ont., Macleod, Alta., and Langley Prairie, B.C., as well as a radio beacon site at Sioux Lookout, Ont., and a wireless station site at Fort Resolution, N.W.T.(10)

R.C.A.F. Flying Time

During the year the total time flown by the RCAF on training and operations was 16,059.10 hours, an increase of 3592 over the 1934-35 year. Operations accounted for 5339 hours, individual flying training for 5607, and unit training for 5113. There were no fatal accidents.(11)

Honours and Awards

In the New Year's honours list for 1935 S/L R.S. Grandy was appointed an Officer in the Military Division of the Order of the British Empire for "outstanding services in pioneering air mail routes." A few months later, in the King's Silver Jubilee awards, S/L G.E. Brookes received the same decoration (OBE), and WO 1 A.A. Rabnett the MBE. These were the first awards of chivalry conferred upon the RCAF.

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(10) Many of the emergency landing fields cleared under the unemployment relief project were used for training schools during the Second World War.

(11) Three officers and thirteen other ranks of the RCAMC were detached for duty with the RCAF.

C. Operations

Operations for civil departments increased by 300 hours during 1935-36. The most significant feature of the year's work was the expansion of aerial photography which, with 1737 hours, had regained its place as the major civil government operation. The preventive service decreased somewhat to 1736 hours; transportation also declined to 369 hours, while forestry patrol increased about 50% to 208 hours. No. 5 Squadron at Dartmouth and No. 8 at Winnipeg did the bulk of the civil government work.

Photographic operations were carried out by four mobile General Purpose Detachments working over areas from the maritimes to the Northwest Territories. Nos. 2 and 3 G.P. Detachments of No. 8 Squadron flew almost 982 hours on photography around Port Arthur and Long Lac in Ontario, Gods Lake, Knee Lake and Oxford Lake in Manitoba, Cree Lake in Saskatchewan, Great Slave Lake, Reindeer Reserve, and the Rat and Bell Rivers in the Northwest Territories. In eastern Canada Nos. 6 and 7 G.P. Detachments of No. 7 Squadron flew 754 hours on photographic operations near Sault Ste. Marie, Sudbury, Haileybury and Peterborough in Ontario, the lower Gatineau valley, Senneterre, Lake Waswanipi, Lake Chibougamou, Joliette and Baie Lavalliere (near Sorel) in Quebec, Saint John, N.B., Charlottetown, P.E.I., Ship Harbour, N.S., and the coast of Cape Breton Island from Cheticamp to Cape Smoke. For the provincial Department of Public Works and Mines several small mineral areas in Nova Scotia were also photographed. On the Pacific coast No. 4 Squadron did a small photo job near Alvin (Pitt Lake) for the federal Department of Public Works.

The primary role of No. 5 Squadron at Dartmouth was the preventive service for the RCMP on which 1544 hours were flown by the four detachments based at Gaspe, Shediac, Sydney and Dartmouth; no detachment was stationed at Rimouski this year. One aircraft detached from No. 4 Squadron at Vancouver contributed 192 hours on preventive patrol along the west coast of Vancouver Island.

In transportation there were the annual flights for Indian Treaty payment parties, No. 7 Squadron conveying one party to points in northern Ontario while No. 8 flew another from Lac du Bonnet to Berens River, Little Grand Rapids, Pikangikum and Sandy Lake in northern Manitoba. The RCAF also assisted in the general election in October 1935 by transporting ballot boxes to the Magdalen Islands and Senneterre. Government officials were carried on inspection flights along the trans-Canada highway route from North Bay to Winnipeg, and to points in northern Alberta and the N.W.T. Surveyors were flown in to the fields of their operations, and a mercy flight was made to carry the wife of the wireless operator at Resolution to hospital at Fort Smith.

Forest patrols continued during the fire hazard periods in the National Parks at Riding Mountain and Prince Albert. Nos. 4 and 5 Forestry Detachments of No. 8 Squadron in charge of Sgts. Ready and Miscampbell flew about 208 hours.

Operations for the Department of National Defence totalled 1289 hours, most of which was done by aircraft based at Ottawa. Service administration, serviceability tests and test and development work for the RCAF accounted for most of this operational flying. Transportation of officials and airworthiness tests of aircraft for the Controller of Civil Aviation branch consumed 240 hours. Aerial photography and transportation for the Militia Service required 109 hours, while the Naval Service received 29 hours flying on reconnaissance in the vicinity of the Queen Charlotte Islands.

D. Training

In the past training had been under the direction of the Air Personnel Staff Division at Headquarters, but the rapid expansion of these activities - 4922 hours in 1932, 5940 in 1933, 7332 in 1934 and 10,721 in 1935 - and in particular the increase in unit training, led to a division of responsibility in February 1936. Individual training remained under the Staff Officer Air Training in the Air Personnel Staff Division while unit training was transferred to the Air Staff Duties branch of the Air Staff Division.

Unit flying training by the PAAF totalled 2942½ hours, including 338 on co-operation with the Army and Navy. No. 2 Squadron at Trenton, which for the greater part of the year consisted of only one flight, continued training according to RAF syllabi for army co-operation units, and received practical training in co-operation with the Militia during summer camps in M.D.s 3, 4 and 5. As in the previous year the pilots and air gunners went to Camp Borden for armament training in air and ground gunnery and bombing. The "Siskin" fighter flight at Trenton, now included in No. 3 Squadron, continued training as in previous years and gave demonstrations at several points. The bomber flight of that squadron and No. 6 (TB) Squadron were still awaiting aircraft to begin their training. No. 4 (FB) Squadron was able to enlarge the scope of its coastal reconnaissance training thanks to the receipt of new equipment for both ground and air instruction. It did some co-operation training with units in MD 11, while No. 5 at Dartmouth also did some exercises on the Atlantic coast with the Army and Navy. In addition to this air training all stations carried on unit ground training in drill and musketry supplemented by lectures in various service subjects.

In the NPAAF, 2171 hours were flown on preliminary training by Nos. 10, 11 and 12 (AC) Squadrons. These three units also attended summer camp for the first time, spending ten days in training at Camp Borden, Sea Island and Shilo, respectively. Technical training was given to the airmen who were tested by a travelling Central Trade Test Board of the Permanent Force. The newer Non-Permanent squadrons had not yet started training.

Individual training, directed by the Air Training branch of the Air Personnel Staff Division, followed much the same pattern as in the previous year. The various courses of flying instruction totalled 5607 hours, of which the Training Group at Camp Borden did almost 90%; some courses were also given at Ottawa, Winnipeg and Trenton. The training curriculum included courses in ab initio training, instrument flying, army co-operation, flying instructors, seaplane conversion, wireless operators, air gunners, advanced photographic, camera operators, and automatic pilot. For the Army there were courses for Permanent and Non-Permanent senior officers and intelligence liaison officers. Courses for commercial pilots included flying instructors categorization and instrument flying.

Ab initio flying training was greatly expanded in 1935. Instead of courses of 12 to 15 trainees as in the past two or three years, there was an intake of 31 pilot officers (provisional) on 13 June 1935, four of whom had received some training previously in the summer of 1931; at the end of August a supplementary intake of eight candidates reported to Camp Borden to replace wastage from the original group. Of the 38 members of the 1935 course, 24 received their wings in May 1936. Two of the graduates, J.W. Dallamore and J.A.G. Gordon, then joined the RAF. The other 22 new pilots remained with the RCAF; they were D.A.R. Bradshaw, F.C. Carling-Kelly, R.C. Davis, G.P. Dunlop, C.H. Greenway, R.F. Gross, W.E. Kennedy, M.D. Lister, G.D. Macallister, W.R. MacBrien,

E.M. Mitchell, N.B. Petersen, C.H. Porter, R.C. Procter, J.D. Twigg, J.A. Verner, H.E. Walker, D.G. Williams, P.G. Baskerville, R.F. Davenport, R.M. McKay, and R.C. Ripley. Three other members of the course transferred to the Non-Flying List of the PAAF, and one of them subsequently qualified for his flying badge.

The training of airmen pilots was resumed after a five years' break and in the spring of 1936 five sergeant pilots were graduated at Camp Borden - P.E. Sorensen, S.D. Turner, J.C. Mirabelli, R.A.W. Gilmour, and M.E. Ferguson.

The Technical Training School at Camp Borden gave ten-months courses to train apprentices in ten different trades for a total of 133 airmen - 32 carpenters, 29 fitters, 28 wireless operators, 13 armament artificers, 8 motor mechanics, 7 fabric workers, 7 motor boat crewmen, 5 instrument makers, 2 coppersmiths and 2 machinists. In addition to these courses in the T.T.S. there were other ground training courses engineer and squadron armament officers, airmen armament instructors, drill instructors, and fitters and riggers (for general overhaul experience on metal airframes such as the "Siskin" and "Atlas").

Training outside the RCAF was expanded to provide instruction for 10 airmen at aircraft and motor factories in Canada, while an officer attended a course in metallurgy. On courses in the United Kingdom there were eight officers - W/C L.S. Breadner at Imperial Defence College, F/Ls F.G. Wait and A.P. Campbell at RAF Staff College, S/L T.A. Lawrence at the School of Army Co-Operation at Old Sarum, F/L C.R. Dunlap at the Air Armament School at Eastchurch, F/L R.E. McBurney at the Electrical and Wireless School at Cranwell, F/L D.H. MacCaul at the School of Aeronautical Engineering at Henlow, and F/O H.R. Carefoot at the Imperial College of Science. S/L F.C. Higgins replaced S/L Lawrence as Liaison Officer at the Air Ministry. In another exchange of officers F/Ls M. Costello, A. Lewis and N.E. Sharpe went to the RAF for a two-year tour, and F/Ls R.B. Brown, J.A.H. Louden and J.G.W. Weston came out to Canada.

Signals

The last-named RAF officer, F/L Weston, succeeded F/L Pattison as head of the signals service that was being developed in the RCAF. As mentioned above, this work had expanded so much in the past few years that a special branch had been set up at Headquarters to deal with it. As in other fields the organization was being built up on lines similar to the RAF and F/L R.E. McBurney was sent overseas in April 1935 to take a signals course in the RAF school at Cranwell. On completion of the course in the summer of 1936 he became the first RCAF officer to receive the specialist's symbol "S".

At home two W/T operators training courses were completed and personnel were enlisted for two more courses. The training was originally given at Camp Borden until, in February 1936, it was moved to Trenton where a new training laboratory had been fitted out and W/T out-stations were being prepared. Many of the airmen enlisted for this trade already held Department of Marine certificates so that it was possible to reduce the training course to a period of 40 weeks.(12) In February 1936 a qualification badge was

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(12) "All Signals personnel have shown great keenness and all Signals work has been carried out in an efficient and conscientious manner." D.N.D. Report 1935-36; p. 65.

introduced for wireless operators and wireless operator mechanics. The badge was a hand grasping a thunderbolt and was worn on the right sleeve of the uniform above the badge of rank.(13) The RCAF was now able to operate and maintain all the signals requirements for the RCMP preventive service in the maritimes which previously had been provided by the RCCS. An efficient point-to-point routine was operated between the detachment bases during the period that they were active, and very successful results were obtained from the aircraft on patrol. Satisfactory results were also attained on two point-to-point routines opened during the year between Trenton and Ottawa and between Vancouver and Esquimalt in conjunction with the Royal Canadian Signals and the Royal Canadian Navy.

Other services, however, were less satisfactory. An attempt to establish wireless communication between Ottawa and No. 7 Detachment while it was working at Waswanapi in northern Quebec was only partially successful; the detachment received signals from Ottawa fairly well, but Ottawa could not pick up its signals. Aircraft engaged on army co-operation exercises during the year also used W/T with indifferent results due to the obsolete equipment in use.

Re-equipment was delayed by the slow delivery of new type aircraft and ground equipment from overseas. Only one new type aircraft set had been received during the year, and all other aircraft had to use old type equipment. More new sets were on order, however, and delivery was expected early in 1936. Army co-operation aircraft had been refitted to accommodate the new sets, and it was hoped that day bomber, torpedo bomber and flying-boat aircraft would also be fitted with new sets in the near future. The photographic detachments were to be supplied with W/T sets for their operations in 1936. Two mobile W/T tenders had been fitted out for army co-operation work; one was a standard Chevrolet truck and the other a Ford chassis equipped with a special type body. Another Chevrolet chassis had been purchased for conversion to a tender.

The three army co-operation squadrons in the NPAAF carried out wireless ground training with old type aircraft equipment that had been issued to them. They were to be supplied with new type aircraft and ground equipment when supplies were received from overseas.

During the year the Air Ministry carried out two series of long-range transmission tests which were received by both Dartmouth and Trenton. The tests gave the RCAF operators valuable experience in long-distance operating, and also were of value in ascertaining suitable frequencies for such communication.

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(13) A.F.O. 39/36.

E. Aeronautical Engineering

Conversion of the Vickers "Vancouver" to service use continued with the completion of two aircraft (fitted with Armstrong Siddeley "Serval" engines) and the placing of a contract for the conversion of another. The experimental installation of an Armstrong Siddeley "Civet" engine in a Fleet trainer proved so satisfactory that an order was placed for ten "Civet" Fleets, the airframes to be built at Fort Erie and the engines assembled in Canada from parts made in England. The ten Fleets were also to be fitted with transparent cockpit hoods for cold weather flying. Experiments on these hoods, so important for aviation in Canada, had now reached a stage of development that made it possible to procure supplies by contract.

The obsolescence and deterioration of aircraft in use in the RCAF, and requirements to meet expanding commitment, necessitated the preparation of specifications for the reconditioning of four existing types and specifications for five new types that were needed. Specifications were also prepared for streamlined skis and two contractors supplied twelve pairs for service trials which were successfully concluded during the winter. In close collaboration with the Aeronautical Engineering Division the National Research Council undertook experiments to investigate the friction of skis upon snow and ice surfaces.

Work continued on the mounts for cameras. The 1935 model was completed for use in the Bellanca, and a variation was designed for the Northrop "Delta" and the Fairchild "Super 71" that were being procured for photographic operations.

Much of the force's flying was done on water aircraft - floatplanes and flying-boats - which often had to operate in isolated areas away from base where beaching and servicing facilities were not always adequate. To meet the need for some type of floating mobile equipment to assist in inspection and running repairs, a specification was prepared for a seaplane tender in the form of a large scow on which the aircraft could be hauled up by a ramp; an experimental tender was built by contract.

Both the airworthiness and inspection sections of the A.E. Division had to be enlarged to meet increasing pressure of work. The airworthiness section had for some years been the only place in Canada where aeronautical technicians could be trained; two junior engineers were added to the staff. A resident inspector of the inspection branch was appointed at Edmonton to meet the requirements of aircraft operators in northern Alberta. There were now five resident inspectors at Montreal, Ottawa, Toronto, Winnipeg and Edmonton.

Thanks to the increase in funds the supply situation began to improve and in pursuance of the development of the RCAF on service lines more armament and armament supplies were ordered. Two motor-boats of the type used by the RAF for seaplane tender work were procured and sent to Dartmouth and Vancouver for service trials.

A separate branch of the division was set up to handle the supply and issue of publications.

Chapter XX

The Royal Canadian Air Force in 1936

A. Parliament

The aviation estimates which Mr. Ian Mackenzie, the Defence Minister in MacKenzie King's new Liberal government, presented to the House in May 1936 called for an appropriation of $5,801,100 or an increase of almost $1,500,000 over the previous year. There were, as usual, three items. The RCAF was to receive $4,130,000 (an increase of $1,000,000); for civil government air operations $408, 300 would be required (a decrease of $16,700); and for civil aviation $1,262,800 (an increase of $514,900).

The debate on the RCAF item consisted almost entirely of an exchange of questions and answers between Mr. H.C. Green, the Conservative member for Vancouver South, and Mr. Mackenzie. The opposition member opened the discussion by asking whether any steps had been taken to develop the air defences on the coasts of Canada - the first time such a question had been asked in the House of Commons. The minister replied that that was "one of the first problems before the department" as it had been for several years; his predecessor had laid plans for the study of coastal defences, particularly in British Columbia, and this year's estimates provided for increased accommodation at Jericho Beach. "The air defences will be increased from time to time as funds are available.....The ultimate plan is for a considerable increase in the air forces on the Pacific coast." Air and naval expansion, he added, should go concurrently, but he admitted this was being done "in a very modest way" although they were proceeding "as fast as the economic resources at present available will permit...."

While commending the minister for the increase in the appropriation, Mr. Green pressed for information about the cost of establishing a complete program of air defence on the Pacific coast. Mr. Mackenzie said the answer to that question "would depend entirely upon how far the government in power would go in a policy of expansion", and also upon the technical advice of officers "who must see that there is created in Canada, not a large air force, but an air force sufficient to look after the defence of the dominion." The increase in the estimates indicated that the government was alive to the situation, although personally he would like to see an even greater increase. Most of the money was to be used for new ground services, equipment and maintenance, and only three new aircraft (Blackburn "Sharks") would be purchased.

This statement prompted Mr. Green to ask if Canada had any really modern fighting planes. Mr. Mackenzie admitted they were "very much limited in number." There were some and it was hoped to get more, in addition to overhauling and reconditioning some of the present aircraft; the "Sharks" were the most modern planes of their type. To Mr. Green's retort "so that we shall have only three fighting planes in the whole of Canada", the minister replied that last year about ten "fairly modern" aircraft had been secured. He would not admit the opposition member's accusation that "after this vote is expended our effective fighting air force will comprise only ten planes." Many aircraft had been overhauled and re-engined, but "the economic resources of this country will not be equal for some years to anything like a real development in this direction." Meanwhile the government was hoping to provide "as soon as we reasonably can a modest but effective air force for the dominion, a force such as is considered reasonable by the technical officers of the department."

Mr. Green then turned to training in air fighting, artillery observation, army co-operation and other military roles, and asked if it was not a fact that very little time was spent by the air force in fighting training and that it was really doing considerable work, such as mapping, that could be done by civil aviation. Mr. Mackenzie replied that that was "true to some extent only...." To another question about provision to guard an empire air route across Canada, the minister answered that the subject had not come up as a matter of policy. The exchange ended with Mr. Green's assertion that "apparently we have a very small air force. After all, we are a nation. Is there any reason why we should not build up an effective air force for defensive purposes?" To which the minister replied: "My judgment is that we should have a reasonably modest but effective air force in the dominion." (1)

Speaking on the item of $408,300 for civil government air operations, Mr. Mackenzie pointed out that although the vote was "entirely civil", the type of aircraft used was in many cases a "semi-military" one, and provision had been made for the purchase of four new aircraft, at a cost of $60,000 each, of a type (the Northrop "Delta") that was "easily convertible for military purposes." (2)

The civil aviation item of $1,262,800 was the last appropriation made for that branch while it was a part of the Department of National Defence. Earlier in the session a resolution had been introduced providing for the transfer of civil aviation from the Defence Department to a proposed Department of Transport, and on 1 November 1936 the new department took over the Controller of Civil Aviation branch which had been part of the Air Board and the Department of National Defence since 1919.

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(1) Hansard, 1936 Session; Vol. IV, pp. 3170-72.

(2) Ibid.; pp. 3173-75.

The debate on the civil aviation item aroused a long discussion about the aircraft issued to flying clubs, the development of the trans-Canada airway, trans-Atlantic routes, research, landing fields in western Canada and other topics. One of the sharpest exchanges was started by Mr. C. G. MacNeil, the C.C.F. member for Vancouver North, who condemned the government's purchase of the Avro "Avian" for issue to the flying clubs and criticized the government for sacrificing civil aviation to military. Attacking "out-dated traditions" in the Department of National Defence, Mr. MacNeil charged that the country was not receiving adequate value for the money spent on national defence. Mr. Mackenzie defended both the "Avian" purchase and the military air force, and was supported by Mr. Stirling, his predecessor in the defence portfolio. (3)

The main estimates for the RCAF, CGAO and civil aviation were subsequently increased by supplementary estimates of $1,008,115, subdivided into $555,028 to the RCAF (total $4,685,028), $106,687 to Civil Government Air Operations (total $514,987), and $346,400 to civil aviation (total $1,609,200). The total aviation appropriation, amounting to $6,809,215, had almost returned to the peak figure set in 1930-31, but instead of being divided one-third to the RCAF and two-thirds to CGAO and civil aviation, the ratio was now reversed and the RCAF received the two-thirds. The supplementary estimate for the RCAF was required primarily for additional aircraft purchases - flying-boats ($170,000), torpedo-bombers ($166,298), general purpose ($100,000), and trainers ($30,000); the balance was to be expended on engineer services ($33,670), engine parts ($25,000), wireless equipment ($15,000), and civil salaries ($15,000). The item passed without discussion. The additional civil aviation funds were needed to complete airports and landing fields that had been started but not finished under the unemployment relief project. (4)

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(3) Ibid.; pp. 3175-88.

(4) Ibid.; pp. 4066-67.

B. R.C.A.F. Strength and Organization

The increase of $2,500,000 in the appropriation for aviation permitted further progress in both the civil and military branches. The development of the western section of the trans-Canada airway was accelerated, while on the service side the strength of both the P.A.A.F. and N.P.A.A.F. was increased, more modern aircraft and equipment were purchased, and the construction of some of the more essential accommodation for personnel and equipment was undertaken. It took time, however, to build and deliver aircraft and construct buildings and because of the delays, at a time when both the aviation and construction industries were flooded with orders, almost $1,000,000 of the aviation appropriation remained unexpended at the year's end.

Aircraft

Quantitatively, the aircraft situation declined - there were only 135 aircraft on charge at 31 March 1937 as compared with 154 the previous year - but qualitatively the situation was improving as obsolete types, such as the "Moth", were withdrawn from use and new, more modern types were ordered. In addition to the six reconditioned "Wapitis" and three Avro 626s, still outstanding from the previous year's contracts, new orders were placed for five Supermarine "Stranraer" flying-boats, four Northrop "Delta" photographic aircraft, three Blackburn "Shark" torpedo-bombers, ten Fleet trainers, an Avro 621 "Tutor", and one of the new deHavilland "Tiger Moth" trainers. Delivery of these aircraft was expected in the spring and summer of 1937, except the "Stranraer" for which no definite date of delivery could be given.

During the year the four "Sharks" ordered in 1935 were received for service use (5), twenty Fleets for ab initio training, and three "Deltas" and two "Super 7ls" for civil operations. (6) With these additions the aircraft strength at the end of March 1937 was:

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(5) In answer to a query whether some of these were defective the Defence Minister told the House that "some not unexpected difficulties have arisen, partly due to the Canadian winter climate and partly to inexperience of this equipment on the part of the RCAF personnel. These matters are being righted." Hansard, 1937 Session; Vol. II, p. 1083 (22 February 1937).

(6) Additions to the civil fleet were necessary to meet modern air survey requirements, to replace obsolete types, and also to replace three aircraft that had been destroyed in the storm at Vancouver in 1935.

Service types

"Atlas"	army co-operation	15	
"Siskin"	fighter	8	
"Shark"	torpedo-bomber	4	
"Vancouver"	flying - boat	4	
	Total	31	31

Training types

"Fleet"	ab initio trainer	37	
"Tutor"	advanced trainer	6	
"Tomtit"	advanced trainer	2	
"Courier"	advanced trainer	1	
	Total	46	46

Civil operations types

"Pacemaker"	12	
"Vedette"	12	
Fairchild 71	18	
Fairchild 51	9	
Fairchild FC2W	1	
Fairchild Super 71	2	
"Delta"	3	
Ford	1	
Total	58	58

Grand total 135 (7)

(7) This was the officially reported strength; the actual strength was 127. One "Atlas" and one "Vedette" had been destroyed, the Fairchild FC2W reduced to produce, and the Ford and four "Pacemakers" sold.

Personnel

During the year nine officers were commissioned and 112 airmen enlisted in the P.A.A.F. Attrition due to retirement, discharge or death amounted to three officers and 37 airmen, leaving a net increase of six officers and 75 airmen. The strength of the Permanent Force at 31 March 1937 was 148 officers and 959 airmen. There was a marked expansion in the N.P.A.A.F. which rose by 24 officers and 204 airmen to a total of 76 officers and 493 airmen, or approximately one-half the size of the Permanent component. (8)

Applications for commissions or enlistment in the RCAF and RAF continued to rise rapidly, reaching the unprecedented total of almost 12,000 during the year. The publication of the increased estimates for the RCAF caused a very noticeable increase in the number of applications. The Canadian service could absorb only a small fraction of the applicants, and more and more turned to the RAF which continued to accept more Canadians for commissions than did the RCAF. In addition to 39 nominations or applications forwarded by the RCAF, of which 19 were accepted and 16 were still pending, 40 candidates made direct application to the Air Ministry.

There were three deaths in the service during the fiscal year. One airman was drowned, another died from natural causes, and F/L R.C. Minnes lost his life in an automobile accident at Maitland, Ont; on 27 February 1937, in which an Army officer also was killed.

Organization

Further progress was made towards putting the RCAF "on a proper service basis." The "Siskin" fighter flight in No. 3 Squadron at Trenton was organized, on paper, as No. 1 (Fighter) Squadron, but its actual strength remained only that of a small flight. No. 6 (Torpedo-Bomber) Squadron, which had been authorized to form at Trenton on 1 November 1935, began to take shape as its aircraft, Blackburn "Sharks", arrived from Britain early in 1937; it was expanded by the addition of a second flight. No. 8 (General Purpose) Squadron was moved from Winnipeg to Ottawa on 1 February 1937, where its two general purpose detachments were amalgamated with the two of No. 7 Squadron to constitute a re-organized No. 8 Squadron for photographic operations. This change left No. 7 (G.P.) Squadron with a test flight and a general purpose flight for communications work. Some personnel of No. 8 Squadron remained at Winnipeg as the nucleus of No. 2 Equipment Depot which was organized there on 1 February 1937 under the command of S/L Grandy. (9)

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(8) Total enlistments in the N.P.A.A.F. were 362, but discharges (158) reduced the net increase to 204.

(9) On first formation the unit was called No. 2 Aircraft Depot; this was changed to No. 2 Supply Depot in April 1937, and changed again in June 1937 to No. 2 Equipment Depot. It was located in a warehouse at 120 Empress Street, Winnipeg. The substation at Lac du Bonnet, where "A" Flight of No. 8 Squadron had been based, was now closed.

The Training Group was enlarged to include Trenton as well as Camp Borden, and more of the training activities were transferred to the new station. The Flying Training and Air Armament Schools remained at Camp Borden, but the Technical Training and Air Navigation and Seaplane Schools were moved to Trenton. The latter school, hitherto an establishment only without any corporeal strength, moved into the newly completed seaplane hangar and began to organize its personnel and equipment. The concentration of training at Trenton was carried a step further by the organization of a Wireless School early in 1937. Previously the training of W/T operators and mechanics had been conducted by the W/T section of the School of Army Co-Operation, but the increased number of trainees in this trade led to the formation of a separate school.

The organization of the P.A.A.F. was now:

RCAF Training Group

RCAF Station Camp Borden

Flying Training School

Air Armament School

RCAF Station Trenton

Technical Training School

School of Army Co-Operation

Air Navigation and Seaplane School

Wireless School

RCAF Station Ottawa

RCAF Photographic Establishment

No. 7 (G.P.) Squadron

No. 8 (G.P.) Squadron

No. 1 (F.) Squadron)
)
No. 2 (A.C.) Squadron) administered by
) Station Headquarters, Trenton
No. 3 (B.) Squadron)
)
No. 6 (T.B.) Squadron)

No. 4 (F.B.) Squadron, Vancouver

No. 5 (F.B.) Squadron, Dartmouth

No. 1 Aircraft Depot, Ottawa

No. 2 Equipment Depot, Winnipeg

The organization of the N.P.A.A.F. remained unchanged with seven squadrons organized.

RCAF flying time

There was an increase of about 900 hours in flying by the RCAF during the fiscal year, the total being 16,927 hours as compared with 16,059 for 1935-36. Most of the increase was in civil government operations which rose from 4050 hours to 4686. Flying training by N.P.A.A.F. units accounted for the remainder of the increase, with 2402 hours in 1936-37 as against 2171 in the previous year. A decrease in the time spent on individual flying training was offset by an increased amount of unit training.

C. Operations

The increase of some 600 hours in flying on civil government air operations during 1936 was entirely due to a very extensive aerial search for an aircraft missing in the Northwest Territories. As a result, transportation flying was increased fivefold, jumping from 369 hours in 1935-36 to more than 1726 hours in 1936-37. Other civil operations decreased by about 800 hours to 1358 on photography and 1335 on the preventive service. Forestry patrol showed a slight increase. This was the last year in which the RCAF undertook preventive and forest patrols as civil government air operations.

The aerial search which accounted for so much of the year's flying was undertaken to locate F/L S. W. Coleman and LAC J. Fortey, the crew of a Fairchild of No. 8 Squadron which disappeared on 17 August 1936. The crew had delivered an aircraft engine to a detachment working in the MacAlpine Lake area of the Barren Lands, 220 miles northeast of Aylmer Lake, and were on their way back to Fort Reliance when they became lost and, with little fuel remaining, made a landing on a lake. Four days passed before Reliance learned that the Fairchild was overdue; then a widespread search was organized under the direction of S/L Leigh Stevenson. Civilian pilots joined with the RCAF in the hunt for the missing men, and the RCCS wireless station at Outpost Island, N.W.T., was moved to Fort Reliance for a few weeks to assist in the operation. Bad weather greatly hampered the searchers as the days stretched into weeks. Finally, on 14 September, a message was found in an empty gasoline drum at a point 20 miles north of Lac de Gras where the Fairchild had made its forced-landing; the message said that only one hour's fuel remained in the aircraft, and that the crew proposed to fly south for 35 minutes. Two days later Matt Berry and Marlowe Kennedy, two "bush" pilots flying with Canadian Airways and Mackenzie Air Service, found the missing aircraft and its crew, serviceable and safe, on Point Lake well to the west of their forced-landing. For three weeks Coleman and Fortey had lived on their emergency supplies which they had stretched to the limit of rationing out in small quantities. When those supplies were exhausted they had been forced to exist on berries and some ground squirrels which they snared. (10)

Several other search and mercy flights also figured prominently in the year's civil operations. One incident which attracted world-wide interest was the accident at the Moose River gold mine in Nova Scotia in April 1936 which resulted in three men being trapped underground. No. 5 Squadron at Dartmouth made numerous flights to carry medical supplies and rescue equipment to the scene, and after the two survivors had been brought to the surface its aircraft flew them to Halifax for hospital treatment.

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(10) The search cost $52,384,74 and consumed approximately 14,000 gallons of gasoline. Hansard, 1937 Session; Vol. 1, p. 872.

The same squadron also made a mercy flight to carry an emergency case from Sable Island to Halifax, and carried out a search in the Gaspe area for a hunting party lost in the woods. A similar search was made by a detachment in northern Ontario for some men lost in the woods near Rat Rapids; aircraft from Camp Borden hunted for the bodies of men believed drowned in Lake Simcoe and made a reconnaissance over the area in Lake Erie where the "Hibou" had foundered. A mercy flight was also made by a photographic detachment to transport an emergency case from Fort Hope to the hospital at Sioux Lookout, Ontario.

Normal transportation flying included the annual flights into northern Ontario, Quebec and Manitoba for Indian Treaty Payment parties, and flights for officials of government departments making inspection visits to northern areas. Noteworthy among these flights was an extended inspection trip made by the Commissioner of the Royal Canadian Mounted Police from Ottawa to the Yukon. The Fairchild floatplane, piloted by F/L R.C. Gordon, left Ottawa on 5 July and returned a month later (3 August) after flying about 8600 miles on an itinerary which included visits to Edmonton, Goldfields, Rae, Cameron Bay, Coppermine, Cambridge Bay, Aklavik, Richards Island, Fort Yukon, Dawson City, Whitehorse, Lower Post, Fort Simpson, Reliance, Chesterfield, Churchill and Winnipeg.

During the winter months (November 1936 to March 1937) daily flights were made from Fort Smith, N.W.T., to take upper air meteorological and radiation observations for the Meteorological Service of the Department of Transport. While this operation was in progress the radio station at Fort Smith maintained communication with the aircraft and transmitted signals for use with the aircraft's radio compass. Flights were also made in support of an investigation of upper atmospheric conditions undertaken by the National Research Council. In this period of the infancy of radar it is of interest to note that the Department of National Defence co-operated with the National Research Council in a study of the possibility of tracing thunderstorms by means of the cathode ray type direction finder. A warrant officer of the R.C. Signals was loaned to the N.R.C. and later posted to the Forrest beacon station in Manitoba where the necessary equipment for this research was installed. (11)

The photographic detachments working north of Great Slave Lake provided air transport for surveyors from the Department of Mines and Resources, while in eastern Canada officials of the same department were flown on reconnaissance over the scene of an earthquake near Timiskaming, P.Q. Flights were also made for a government motion picture cameraman who was filming the departure of the Vimy pilgrimage from Montreal.

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(11) DND Report, 1937; p. 62.

On photographic operations No. 7 Squadron (Ottawa) and No. 8 Squadron (Winnipeg) each had two detachments in the field. In central and northwestern Canada the Winnipeg detachments worked around Fort Hope and Osnaburgh House in Ontario and in the area north of Great Slave Lake in N.W.T.; a photographic survey was also made of the route of a projected road from Lake Winnipegosis to The Pas. In eastern Canada the Ottawa detachments were busy in the area north of Peterborough and Cat Lake in Ontario, Noranda, Kakabonga Lake, Lake Waswanipi and Lac à la Tortue in Quebec, Charlottetown, P.E.I., and Cape Breton. The total flying on those operations was 1358 hours.

About the same amount of time (1335 hours) was flown on preventive patrol on the two coasts. A one - aircraft detachment from No. 4 Squadron was once again engaged on the west coast of Vancouver Island, while No. 5 Squadron had three detachments based at Gaspe, Shediac and Dartmouth from May to October. The Sydney detachment was not used this year. The RCAF's participation in preventive patrols for the RCMP ceased at the end of 1936 as the Mounties formed their own air division to carry on the work as well as their transportation requirements.

The two forestry detachments of No. 8 Squadron continued to keep watch over Riding Mountain and Prince Albert National Parks, and No. 7 Squadron also did a few patrols in the Petawawa area during a period of high fire hazard. This work, one of the first and for many years the major civil government air operation, also ceased with the close of the 1936 season and No. 8 Squadron was transferred to eastern Canada.

Operations for the Department of National Defence remained at about the same level as in the previous year. Nearly all the work - 1139 hours out of the total 1269 - was test and develoment and administrative transportation for the RCAF. About 130 hours were flown on photography and transportation for the Militia service. The transfer of the Controller of Civil Aviation branch to the Department of Transport relieved the RCAF of the transportation facilities which it previously had provided for that branch.

D. Training

The various types of service flying training - individual, preliminary, unit, and army-navy co-operation - increased by 250 hours to a total of 10,972.

Individual flying training amounted to 4823 hours, most of it (3514 hours) still being centred at Camp Borden. The program there included courses for ab initio pilots, flying instructors, air navigation, and armament (squadron armament officers, instructors and air gunners). Trenton gave courses in army co-operation for RCAF and Army officers, and also did instrument flying and flying instructor training. Ottawa was the centre for photographic training and seaplane conversion.

The ab initio course this year was much smaller than the previous year with an intake of 16 in June 1936. One of the trainees had received some training with the previous year's course. An officer who was transferred from the Non-Flying List joined the course some months later. Nine of the 17 pupils graduated in May 1937 and joined the Permanent Force as pilots; one other officer entered the Non-Flying List. The graduates were F/O J.A. Easton, P/Os C.L. Annis, J.L. Berven, J.D. Blane, F.E.R. Briggs, M.G. Doyle, J.L. Henning, H.B. Jasper, E.L. Miners and K.J.M. Smith. Three airmen pilots also graduated in May 1937 - Sgts. W.G. Pate, R.L. Davis and W.J. Michalski.

A significant addition to the ground training program was a gas course for officers at Camp Borden. There was also a storekeepers course for airmen at that station. Technical training was now given at Trenton with 197 airmen under instruction in various trades. Other courses at Trenton included signals (for officers), seamanship and parachutes (for airmen). No. 1 Depot at Ottawa also did some technical training for riggers, fitters and instrument repairers. Categorization tests for flying club instructors were carried out for 27 candidates at several stations.

Preliminary flying training was carried out by five Non-Permanent squadrons for a total of 2402 hours. The three original units, Nos. 10, 11 and 12, each did 625 to 725 hours, and also spent 14 days training in summer camp at Camp Borden, Rea Island and Shilo. Nos. 15 and 18 Squadrons at Montreal began flying training during the year with 281 and 139 hours respectively. The latest additions to the N.P.A.A.F., Nos. 19 and 20, had developed to the point where they were ready to begin training. In addition to training within the units, some N.P. officers and airmen also attended flying training, army co-op., photographic and armament courses at Camp Borden and Trenton.

Unit training in the Permanent Force increased to 3420 hours. At Trenton No. 2 Squadron received practical training in army co-operation with militia units at summer camp in M.D.s 1 (London), 2 (Toronto),3 (Kingston), 4 (Montreal), 5 (Quebec), 10 (Winnipeg), 12 (Regina), and 13 (Calgary). This was the first year that the squadron sent a detachment of "Atlas" aircraft to western Canada for this training. Pilots and air gunners carried out annual gunnery and bombing practice at Camp Borden. The air gunners, it might be noted, were now entitled to a distinctive badge consisting of winged bullet, point upward, worn on the right sleeve above the badges of rank. (12) No. 3 Squadron, still awaiting delivery of its "Wapiti" bombers, began ground training in January 1937. The "Siskin" fighter flight, officially shown as No. 1 Squadron but still administered as a flight of No. 3, made satisfactory progress with its few, obsolete aircraft. No. 6 was beginning to receive its "Sharks", but had not yet started service training.

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(12) Introduced by A.F.O. 155/36 of 15 June 1936. The badge was blue silk for the blue uniform, and red silk for the summer khaki uniform.

No. 4 Squadron at Vancouver continued training according to the RAF coastal reconnaissance syllabus, and did an exercise with an anti-aircraft section of the RCA. No. 5 Squadron at Dartmouth was busy on preventive patrols until November 1926, but managed to engage in some co-operation training with ships of the RCN and Army units. When the preventive service ended service training was undertaken on its Fairchild floatplanes.

Training on courses abroad showed some significant additions as officers were posted for specialized instruction in various aspects of air operations. There were as usual two officers, W/C S.G. Tackaberry and F/L B.G. Carr-Harris, at RAF Staff College, and F/L MacCaul was still attending the RAF School of Aeronautical Engineering. In addition, F/L J.G. Bryans was at the School of Air Navigation at Manston, F/L W.A. Jones at the Air Armament School at Eastchurch, F/L C.W. Morrison at the Central Flying School, F/L C.L. Trecarten at Gosport for a coast defence course, F/O W.A. Orr at the Electrical and Wireless School at Cranwell, and F/O W.E. Bennett at the RAF Photographic School at Farnborough.

The Trenton tornado

Airmen who were at RCAF Station Trenton in the fall of 1936 have vivid memories of a tornado which swept the station on the afternoon of 29 October. A commanding officer's parade was being held at the time and S/L Lawrence was inspecting the School of Army Co-Operation. A few dark clouds smeared the sky to the southwest over the Bay of Quinte but on the parade square the sun shone brightly on the ranks of airmen standing at attention in high collar tunics and peaked caps with bayonets fixed to their rifles. Around the parade square the tar-paper shacks of construction workers stood out sharply against the gleaming white of the new stucco buildings that were being erected on the station.

Suddenly a "twister" with a funnel half a mile in diameter bore down upon the scene. The parade was dismissed sharply, just as the storm broke, and the airmen barely had time to reach their barracks where they could see stones and debris being blown up to the level of the third floor. In a few moments the howling 100-miles-an-hour winds cut through the centre of the station, leaving a swath of destruction. The tar-paper roofs of the construction shacks started to lift and then the huts began to shift; one was blown half a block, coming to rest against the main administration building. A fire reel house was lifted across the highway; 50-lb. cement blocks on the roof of the workshop were shoved out of position; the temporary heating plant was blown down, the officers' mess was badly damaged, and the roof of a hangar collapsed. A 45-gallon oil drum went hurtling across the parade square, and an airman, still carrying his rifle

and fixed bayonet, was bowled along like a ten-pin as he tried to reach the shelter of a hangar. At their moorings three "Vedettes" were capsized by the force of the wind; one was destroyed. A light aircraft, coming in to land as the tornado struck, touched down safely but was immediately flipped over on its back.

After the twister passed rescue operations began. The station medical personnel were assisted in caring for the injured by a group of wireless operator mechanics who had just completed a St. John's Ambulance course. The injured were taken to hospital in Belleville, the wireless truck being pressed into service to transport an airman who had suffered a broken back.(13)

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(13) See reminiscences of W/C Hoodspith, F/O Mackenzie and WO 2 Naish in "The Clinton Mercury", July 1957; pp. 20, 21, and 24.

E. Signals, Engineering, Construction

Signals

To meet increased demands upon the signals organization, and to rectify as rapidly as possible the shortage of personnel and equipment, a Wireless School was established at Trenton early in 1937. (14) Officers were also being sent annually to Britain to qualify as signals officers in the RAF's 14-months' signals course; short signals courses were also given in the school at Trenton.

The equipment situation had improved with the receipt from the RAF of some modern general purpose aircraft sets which were put in service with the flying-boat squadron on the Pacific coast. Further orders were placed during the year for aircraft and ground sets of the latest types in use by the RAF, but delays in manufacture were holding up delivery.

Army Co-operation exercises were carried out in eastern and western Canada with units of the Militia, on which extensive use was made of wireless tenders. Two photographic detachments of No. 8 Squadron operating in the Northwest Territories were equipped with one-watt wireless sets, in accordance with plans made the previous year. Although the equipment worked successfully, the nature and amount of the service required from them showed that more powerful sets were needed, and plans were accordingly made to increase both the power and the number of sets for the photographic aircraft.

The point-to-point schedules initiated in 1935 between Trenton, Ottawa and Camp Borden and between Vancouver and Esquimalt were continued.

Aeronautical Engineering

Following the formation of the Department of Transport the resident inspectors of the Inspection Branch of the Aeronautical Engineering Division were transferred to the new department; part of the Airworthiness Section was also transferred to the D.O.T. and the remainder of the section was disbanded. The Division continued to do consultation work for the Controller of Civil Aviation, and advised on the organization of an aeronautical engineering branch in the new department.

The Test and Development Branch (as the Technical Development Branch was now designated) began winter experimental trials with a "Perseus"-engined Hawker "Hart" which the Air Ministry sent out on loan. Despite late delivery of the aircraft and unusual winter weather much useful information was obtained.

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(14) G.O. 22 of 1 February 1937.

Bombs were now beginning to appear in RCAF armament (15) and for the first time the Dominion Arsenal listed air weapons - 158 20-lb. Mark I bombs - in its report of output. Deliveries of high explosives were made to Halifax and Esquimalt and arrangements were made to have the Naval Service store and inspect the RCAF stocks. (16)

Construction

Construction expenditures rose sharply. The Army Engineer Services spent $267,868.68 from the main RCAF and CGAO appropriation with a further $488,886.28 from special supplementary estimates. The total of more than $750,000 compared with $175,075 in the previous year. Almost half of the expenditure was on the further development of Trenton where quarters, workshops, hangars and a machine-gun range were constructed. Rockcliffe received a new landplane hangar and barrack block. Jericho Beach at Vancouver was improved and enlarged by the construction of two hangars, a bulkhead wall and slipways. A workshop hangar was started at Dartmouth, and a hangar was also erected at Petawawa for the use of the RCAF. To rectify the lack of magazine facilities for RCAF explosives a preliminary reconnaissance was made to pick a suitable site at Kamloops, B.C. Additional land was acquired for the expansion of Rockcliffe and Jericho Beach. Sites for emergency landing-fields on the trans-Canada airway were also secured at Pontiac, P.Q., St. Eugene, Ont., Reay, Ont., and Cowley, Alta., as well as a radio station at Fort McMurray, Alta.

Survey of Industry

One of the most significant developments of the year was the formation in September 1936 of a Navy, Army and Air Supply Committee, under the chairmanship of the Master-General of the Ordnance, to explore the sources of supply of material which would be needed to meet the requirements of the three services in time of emergency. Sub-committees were set up to deal with various categories of requirements for which detailed lists were prepared. It was decided that the task of surveying the resources of industry to furnish these supplies, when need arose, should be vested in a Central Investigation Committee for which a chairman was appointed in November. Meanwhile preliminary investigations were made of 167 industrial plants to determine the type of stores they could best produce and, in some cases, the approximate time that would be required to come into production. Other departments of government rendered valuable assistance to the survey by supplying detailed knowledge of resources and activities in the industrial fields.

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(15) A.F.O.s 182, 183 and 184 of 15 July 1936 referred to bombs and fuzes introduced by the RCAF. Five types were listed: 100, 250 and 500-lb. A.S. bombs, and 250 and 500-lb. S.A.P.

(16) The RCAF had no magazine of its own until 1938.

Chapter XXI

The Royal Canadian Air Force in 1937-38

A. Parliament

When members of the House of Commons assembled for the second session of the 18th Parliament in January 1937 they were much more concerned with matters of national defence than they had been since 1919. Events of the past few years in Europe, Africa and Asia gave little reason now to believe that "the war to end wars" had indeed achieved its aim. In January 1933 Adolf Hitler became chancellor of Germany and a few months later the Nazi Reich withdrew from the Disarmament Conference and the League of Nations. This was followed by repudiation of the military clauses of the Treaty of Versailles, and reoccupation of the Rhineland. The rearmament of Germany, which had been proceeding "under wraps" for a time, was brought out into the open; the new Luftwaffe expanded so rapidly that by March 1936 Hitler was boasting that it had attained parity with the RAF. Britain began to expand her air forces to meet the threat. In October 1935 Mussolini too rattled the sabre by declaring war on Abyssinia and in May 1936 annexed his conquest to the Italian Empire which was again spreading its eagles over "mare nostrum". The uneasy peace of Europe was further disturbed by the outbreak of civil war in Spain in July 1936, which gave Germany and Italy an opportunity to test their air weapons in support of Franco, while the Communist forces received aircraft from Soviet Russia. In the Far East Japan had dropped out of the League of Nations and was building up her armed forces.

There were some, however, who did not regard these distant developments on the other sides of the oceans as any direct concern to Canada and when the defence estimates for 1937-38 were announced Messrs. C.G. MacNeil and M.J. Coldwell, two CCF members, introduced a motion that the house viewed with grave concern the startling increases in national armament expenditure in contrast with the inadequate provision for social security of the Canadian people. The debate on the motion engaged the house four days and it was finally defeated 191 nays to 17 yeas, the Conservative members of the opposition siding with the Liberal majority on the division.(1) Early in the debate Defence Minister Mackenzie gave a lengthy report on the condition of the air service.

> "We are trying to make good what was lost to Canada through policies which had to be pursued during years of depression.....May I tell the house that when this government took office in October, 1935, there was not a single fighting aeroplane in Canada; there was not a single bomb to be dropped by an aeroplane; there was scarcely any amount of ammunition for guns. If I were to hold office without looking after these details, I could be accused of treason to the high office I now have the honour to occupy. It was my duty to protect our Canadian people, knowing the conditions which prevailed in Canada at that time."

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(1) Hansard, 1937 Session; Vol. I, pp. 876-921 (15 February); pp. 923-965, (16 February); pp. 992-1038 (18 February); and Vol. II, pp. 1039-73 (19 February).

Amplifying this theme, the minister referred to the decrease in flying hours between 1931 and 1934 and added, "in other words, flying was discontinued in Canada during the years of the depression...."(2) Furthermore, in 1935 only 23 aircraft of service types were available in Canada, and not one was suitable for active service under current conditions.(3) The existing air force was "entirely inadequate to meet (Canada's) modest defence requirements...." Modern bases, repair and supply depots, and training centres were needed; the air defences on both coasts must be developed to provide reconnaissance over vast sea areas and long coast lines, and protection of ports against hostile aircraft carriers or long-range aircraft. Mr. Mackenzie's statement that "the question of air defence is becoming one of increasing importance to this country" was supported by Prime Minister King who, toward the close of the debate on the CCF motion, said: "I think everyone recognizes that an air force will be a very necessary form of protection from now on..."(4)

In this debate and in the subsequent discussion of the defence estimates which began a few days later the defence minister gave a detailed account of the increases in personnel and aircraft which were proposed for the RCAF. The estimates called for the appropriation of $11,752,650, an increase of almost $5,000,000 over the previous year (which, it will be recalled, included $1,609,200 for civil aviation which was now under the Department of Transport). Not only was this the largest sum appropriated for the air service since the first vote in 1919, it was also an increase of $6,700,000 (almost 250%) for the RCAF which received $11,391,650. The decrease in civil government air operations permitted a reduction in that item to a modest $361,000.

The strength of the PAAF was to be increased by 48 officers and 540 airmen (more than 50%), to give it a total of 195 officers and 1498 airmen, and the NPAAF would be almost doubled by the addition of 42 officers and 491 airmen.(5)

Most of the additional money was to be used for the purchase of new equipment. Since April 1934, when re-equipment of the force began with a modest increase in the appropriation, 61 aircraft had been ordered.(6) There were now 182 aeroplanes on hand, most of

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(2) Mr. Mackenzie gave the flying time for 1931-32 as 32,095 hours, which included both RCAF and CGAO flying; his figure of 5,000 hours for 1932-33 appears to be only training time and does not include CGAO (5500 hours). His figure of 1200 hours for 1933-34 cannot be reconciled with published statistics of RCAF and CGAO flying (10,762 hours).

(3) The 23 aircraft were 15 "Atlas" army co-operation machines and 8 "Siskin" fighters. Although the latter were certainly obsolete, the minister's statement that there was "not a single fighting aeroplane in Canada" was not quite accurate.

(4) Hansard, 1937 Session; Vol. II, p. 1052.

(5) At 31 January 1937 the PAAF had 147 officers and 958 airmen, and the NPAAF 76 officers and 455 airmen. The minister gave a breakdown of strength by units.

(6) Ten in 1934, 24 in 1935, and 27 in 1936. The aircraft were 10 "Atlas" army co-operation, 7 "Shark" torpedo-bomber, 6 "Wapiti" bomber (reconditioned), 5 "Stranraer" coastal reconnaissance, 20 "Fleet" primary trainer, 3 "Avro" 626 advanced trainer, 1 "Tutor" advanced trainer, 7 "Delta" photographic, and 2 Super 71 photographic.

which were various training types and many of them obsolete.(7) Service types included 8"Siskin" fighters (obsolete), 15 "Atlas" army co-operation machines (practically obsolete), 4 "Vancouver" flying-boats (obsolescent) and 7 "Shark" torpedo-bombers, with 6 "Wapiti" reconditioned bombers and 5 "Stranraer" flying-boats on order but not yet delivered. In 1937-38, the minister said, it was proposed to buy 102 aircraft at a cost of about $3,000,000(8) Three-quarters of the new machines would be service types and the others ab initio trainers. Included in the service types were 24 bombers, 18 coastal reconnaissance, 12 two-seater fighters, 11 torpedo-bombers, 7 flying-boats, and 3 army co-operation machines.(9) The new aircraft would be "modern in every detail" and, in almost every case, types that had been recommended by the Air Ministry "because it has been for many years the considered policy in all arms of the service that equipment in all branches should be of a pattern identical with that used by the mother country if possible."

Some members were disturbed by the fact that 24 of the new aircraft were to be bombers. Mr. Coldwell summed up their view by stating that "these defence estimates can be construed only as offence estimates". The bomber was an offensive weapon: against whom were we arming; whom were we preparing to attack? Mr. Mackenzie replied that "in the opinion of those whose advice is competent, bombing planes are most effective, with fighter and reconnaissance planes, for defensive purposes." Mr. MacNeil, however, questioned the wisdom of these experts who in the last eighteen years had received approximately $300,000,000 and yet left the country with no defence so that now it had to start anew. This was clear proof, he alleged, of the incompetency of the present staff which relied too much on the advice of experts in the British War Office. "The history of the general staff has been that of retarding development". Despite the criticism of the CCF members the item was agreed to.(10)

After spending so much time on the major item, the members quickly passed the minor CGAO estimate of $361,000 for air survey photography and contingencies which might arise in other operations.(11)

Later in the session a member drew the defence minister's attention to reports which had appeared in the Canadian press stating that a scheme was in operation for training Australian pilots in the Royal Air Force, that a similar scheme was being

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(7) Ninety-four of these aircraft had been built in the years 1927 to 1931, before the depression.
(8) The government, Mr. Mackenzie said, was prepared to build 100 aircraft in Canada, of high velocity, capable of being moved within a few hours for the defence of any part of the country against sporadic raiders. Hansard, 1937 Session; Vol. I, pp. 894-906.
(9) The minister said that the bombers were 18 used "Wapitis" and 6 new Avro 626s; it is not clear why he included the latter as it was a training, not an operational type. The only other type identified was the "Stranraer" flying-boat.
(10) Hansard, 1937 Session; Vol. II, pp. 1142-59, 1161-70. The members spent part of the time arguing about who was responsible for the length of the debate. The speech from the throne at the prorogation of Parliament on 10 April 1937 mentioned that "more effective provision has been made for the defence of Canada." Ibid.; Vol. III, p. 2951.
(11) Ibid.; Vol. II, p. 1170.

established in New Zealand, and that the Under Secretary of State for Air had said Britain would welcome adoption of a similar system by Canada. In reply to the member's query whether Canada had taken, or intended to take, any such steps, Mr. Mackenzie said he had just tabled a return giving exhaustive information on the matter.(12) Under arrangements made with the Imperial authorities Canadians were eligible for entry into the RAF either with permanent commissions or short service commissions, or as aircraft apprentices. Two vacancies a year were allotted to Canada for permanent commissions, one being normally reserved for a graduate of RMC and the other for an applicant from the applied science faculty of a Canadian university; candidates were required to have completed an ab initio flying training course with the RCAF. Applicants for short service commissions in the general duties branch who were in possession of civil pilot licenses were recommended by the Department if medically fit and otherwise suitable, but were required to travel to England at their own expense and risk for final interview and examination by the RAF. Applicants not in possession of a civil pilot licence were not eligible for recommendation, but could apply directly to the Air Ministry. Candidates who applied to the Department for appointment to short service commissions in the medical branch of the RAF were interviewed and medically examined prior to proceeding overseas for final acceptance by the Air Ministry. The Department could also nominate boys, 15 to 17 years of age, who were medically and educationally acceptable, for enlistment as aircraft apprentices. Other Canadians wishing to enlist in the RAF could go to England at their own expense for consideration "as an ordinary English applicant." The Department of National Defence had no information about these direct entries.(13)

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(12) Ibid.; Vol. III, pp. 2049-50.
(13) Return tabled in reply to series of questions by Mr. Elliott (Kindersley), 23 March 1937; Sessional Paper No. 237.

B. R.C.A.F.

Strength

The 1937-38 fiscal year was marked by a major increase in the strength and significant changes in the organization of the Force. The PAAF expanded by more than 50%, adding 30 officers and 564 airmen to reach a total strength of 1701 (178 officers and 1523 airmen).(14) Although the increased appropriation permitted the intake of more personnel, some difficulty was now being experienced in obtaining suitably qualified candidates for the general list.

The NPAAF also expanded by over 40% and reached a total of 80 officers and 729 airmen at 31 March 1938, an increase of 4 officers and 236 airmen.(15) There were 153 officers on the Reserve.

The wide publicity given in the press to the expansion of the Royal Air Force continued to stimulate the flow of applications for entry into that service or the RCAF. About 14,000 enquiries were received during the year, or 2,000 more than in the previous twelve months. Thirty-five Canadian candidates were recommended and accepted for short service commissions in the RAF, and 15 more began training to qualify for appointments under the new "Trained in Canada Scheme." Four Canadian youths were also nominated for aircraft apprenticeships in the RAF.

There were nine casualties during the year, including an RAF officer on exchange to the RCAF. Five officers and two airmen were killed in flying accidents; an officer lost his life in an automobile accident, and an airman died from natural causes.

Organization - PAAF

To keep pace with changing conditions and requirements, the organization of Air Force Headquarters was rearranged and expanded, particularly in the Air Staff Division to which were added new branches for plans and service operations, service training, and armament. The new organization was:

Senior Air Officer

Air Staff Division
- Directorate of Air Operations, Plans and Organization
  - Plans and Service Operations Branch
  - Air Organization Branch
- Directorate of Air Staff Duties and Service Training
  - Air Staff Duties Branch
  - Service Training Branch

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(14) Appointments to commissions totalled 36, of which 23 were on the general list and 13 on the non-flying; six officers were lost in accidents in the air and on the ground. Enlistments of airmen numbered 622, and discharges 58.
(15) Appointments and enlistments in the NPAAF numbered 18 and 451 respectively, but retirements and discharges reduced the net increase to almost one-half.

Civil Government Air Operations Branch
RCAF Signals
RCAF Armament

Air Personnel Staff Division
Directorate of Air Personnel
Air Personnel Training Branch

Equipment and Development Staff Division
Directorate of Air Equipment
Procurement Branch
Maintenance Branch
Stores Administration Branch
Publications Section
Directorate of Air Development

In the field the most significant development was on the Pacific coast where Western Air Command was formed, effective 1 March 1938, with headquarters at Vancouver.(16) The defence of Canada no longer seemed as academic a matter as it had a few years earlier, and with the Japanese brandishing their samurai swords in China some concern was felt about the safety of the Canadian west coast. The new air command - the first in RCAF history - was charged with the administration of all Air Force units, both PAAF and NPAAF, in Alberta and British Columbia. Initially these units consisted only of a station, a repair depot, one Permanent squadron and two Non-Permanent squadrons. The site at Jericho Beach was again organized as RCAF Station Vancouver to administer No. 4 (General Reconnaissance) Squadron(17) and the newly-formed No. 3 Repair Depot. Authorized on 1 April 1937, the depot at first had only a nucleus of personnel which was to be augmented by more airmen as soon as they had completed their courses in the Technical Training School at Trenton. The Non-Permanent squadrons were No. 111 at Vancouver and No. 113 at Calgary.

In the Training Group the concentration of flying training at Trenton was completed by the transfer from Camp Borden of the Flying Training School and the Air Armament School late in June 1937. The FTS was expanded by an additional flight for the training of pilots for the Royal Air Force. An Equipment Training School was also formed at Trenton(18) which now embraced seven schools for air and ground training.

To make room for the expansion of training facilities at Trenton, No. 2 (Army Co-Operation) and No. 3 (Bomber) Squadrons were both moved to Ottawa in June 1937. No. 1 (Fighter) and No. 6 (Torpedo Bomber) Squadrons remained at Trenton.

The move of the FTS and AAS from Camp Borden appeared to complete the transfer of training units to Trenton which had been proceeding step by step for several years. Camp Borden, however, was not abandoned. The growth of the Air Force with its greatly

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(16) G/C G.O. Johnson was transferred from Trenton to take command of W.A.C. on 6 April 1938.
(17) No. 4 (Flying Boat) and No. 5 (Coastal Reconnaissance) had both been redesignated General Reconnaissance Squadrons on 1 December 1937.
(18) Authorized on 1 April 1937, the unit was originally designated Stores School, the name being changed to Equipment Training School in November 1937; see G.O.s 64 and 159 of 1937.

increased requirement for tradesmen made it necessary to expand technical training and in April 1937 a second TTS was formed at Camp Borden to train recruits who could not be accommodated in the school at Trenton.

In earlier years five Aircraft Inspection Detachments had been formed under the Aeronautical Engineering Division to inspect work done in the plants of aircraft manufacturers. When the Department of Transport was formed the civil aspect of this work was transferred to it, but to meet service requirements two Technical Detachments were formed on 1 March 1938 to account for and inspect work in the plants of manufacturers holding contracts for the production of aircraft for the RCAF. No. 11 T.D. at Montreal was initially under the command of F/L A.O. Adams, and No. 12 at Toronto was under F/L R.G. Ford.(19)

At 31 March 1938 the organization of the PAAF was:

RCAF Headquarters, Ottawa

RCAF Training Group
- RCAF Station Headquarters, Camp Borden
  - No. 2 Technical Training School
- RCAF Station Headquarters, Trenton
  - No. 1 Technical Training School
  - School of Army Co-Operation
  - Flying Training School
  - Air Armament School
  - Air Navigation and Seaplane School
  - Wireless School
  - Equipment Training School

Western Air Command Headquarters, Vancouver
- RCAF Station Headquarters, Vancouver
  - No. 4 (General Reconnaissance) Squadron
  - No. 3 Repair Depot

RCAF Station Headquarters, Ottawa
- RCAF Photographic Establishment
- No. 2 (Army Co-Operation) Squadron
- No. 3 (Bomber) Squadron
- No. 7 (General Purpose) Squadron
- No. 8 (General Purpose) Squadron

No. 1 (Fighter) Squadron) administered by Station H.Q.
No. 6 (Torpedo Bomber) Squadron) Trenton
No. 5 (General Reconnaissance) Squadron, Dartmouth
No. 1 Aircraft Depot, Ottawa
No. 2 Equipment Depot, Winnipeg
No. 11 Technical Detachment, Montreal
No. 12 Technical Detachment, Toronto

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(19) G.O. 48/38. No. 12 was originally to be localized at Hamilton, but this was changed to Toronto in June 1938; G.O. 92/38. F/L Ford took command on 30 June 1938.

Organization - N.P.A.A.F.

On 1 January 1937 two more Non-Permanent squadrons were authorized, No. 13 (Army Co-Operation) at Calgary and No. 21 (Bomber) at Quebec, and they began the slow process of organization. No. 13 eventually made good progress, but No. 21 never passed beyond the authorization stage. Nine squadrons in all had now been authorized, seven of which were well organized and actively engaged in training.

Under the numbering originally allotted to the squadrons of the N.P.A.A.F., the size of the Permanent Active Air Force was apparently limited to only nine squadrons. Current planning contemplated expansion beyond that number and, to avoid confusion in numerical designation, the squadrons of the Non-Permanent Active Air Force were all re-numbered on 15 November 1937 by the addition of 100 to their original designation; thus No. 10 became No. 110 and No. 11 became No. 111. Simultaneous with the change in number No. 111 was converted from Army Co-Operation to Coast Artillery Co-Operation, No. 113 from Army Co-Operation to Fighter, and No. 121 from Bomber to Fighter.

Airfield development

An air force needs air bases. Through the past 20 years the emphasis in Canada had been on the development of airfields for internal communication; there had appeared to be no need to develop airfields specifically for the air defence of the Dominion. The Air Force, with its efforts concentrated on training and civil government air operations, had devoted its limited funds to the development of facilities for those activities. But now the situation had completely changed. Civil air operations had tapered off; the service was developing as rapidly as possible on military lines and the problem of defence was becoming increasingly urgent. The new Plans and Service Operations Branch at Headquarters, which was charged with the preparation of defence plans and the summation of requirements for service operations, gave much study to the planning of bases and advanced bases which would be required for the defence of the two coasts.

On the Pacific coast the dearth of sites suitable for development as aerodromes, without involving prohibitive expense, made it necessary "to lay down a general policy of employing seaplanes which can utilize the numerous sheltered harbours if base facilities are provided."(20) To find suitable sites, an extensive survey was made of the coast, employing both air and surface craft, and much information was collected regarding potential bases, meteorological conditions and other factors. The survey was supplemented by photographic operations carried out by a detachment of two aircraft that was engaged in a survey for land defences and in photography for the preparation of maps by the Geographical Section of the Army.

From these surveys four sites were selected for the air defence of the Pacific coast - Jericho Beach (Vancouver), Patricia Bay (Vancouver Island), Alliford Bay (Queen Charlotte Islands), and Prince Rupert. At Jericho Beach the seaplane base, dating from 1920 and hitherto the only station on the B.C. coast, was to be further developed to meet defence requirements. At Patricia Bay a site suitable for construction as a combined land and water

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(20) D.N.D. Report, 1938; p. 96.

base had been surveyed and the property was being acquired. Property also had been obtained at Alliford Bay for an advanced seaplane base and development work was under way. In northern British Columbia extensive investigation had been made for the best seaplane base site around Prince Rupert and it was expected that the final selection would be made early in 1938.

On the Atlantic coast the terrain, although difficult of development, did permit the establishment of aerodromes and it was therefore planned to use landplanes rather than seaplanes for defence. Here too four sites were selected for development at Dartmouth, Yarmouth, Truro and Sydney in Nova Scotia. Dartmouth, like Jericho Beach on the west coast, was one of the original Air Board stations which had been used intermittently through the years for civil government operations; it was now to be developed further to meet service requirements and, in conformity with plans to use landplanes on the east coast, property had been acquired close to the seaplane base where grading and preparation of an aerodrome was in progress. An aerodrome was also being developed at Yarmouth, and the site for another had been selected at Sydney. A site had also been chosen for an "intermediate" aerodrome and a magazine at Truro. Development of the Sydney and Truro bases was to begin in the spring of 1938.

Aircraft

To operate the new bases that were being developed on the two coasts many more aircraft, of more modern types, would be needed to supplement the handful of service machines on strength. Here too great progress was made in 1937-38, although much of the new strength consisted of aircraft on order rather than actually on hand. Actual strength at the end of the fiscal year was 37 service aircraft, consisting chiefly of the old standbys of earlier years, the "Siskin" (6), the "Atlas" (14), and the "Vancouver" (4), but including also two of the newer types, the "Shark" (7), and the "Wapiti" (6).(21) But supplementing this small and obsolescent fleet were orders for 68 service types for future delivery: 18 more "Wapiti" bombers and 13 more "Shark" torpedo bombers, plus 18 "Bolingbroke" general reconnaissance aircraft, 12 "Lysander" two-seater fighter and army co-operation aircraft, and 7 "Stranraer" flying-boats.

For training types the R.C.A.F. placed its major reliance on the Fleet for ab initio training and had ordered 7 more to expand its stock of 36. There were still 31 of the old "Moth 60's" on hand, but the new "Tiger Moth 82" was now coming into use; one was already on hand and 20 more were on order. For advanced training there were 7 Avro 621s and 3 Avro 626s with 9 more on order. In addition there were the 2 "Tomtits" and 10 "Vedettes" which now had been withdrawn from civil government operations and relegated to training.

There was less requirement now for civil types except for air photography and transportation. The Northrop "Delta" was coming into use as a photographic machine, with 3 on hand and 8 on order. In addition there were 16 Fairchild 71s, 9 Fairchild 51s, 1 Fairchild

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(21) It is noteworthy that, in contrast to the custom of previous years, the D.N.D. Report for 1937-38 contains no reference to the aircraft situation, an indication possibly of growing security - consciousness.

Super 71, and 8 Bellancas available for civil work.

The total flying by the RCAF during the fiscal year was 19,778 hours, an increase of 2850 hours or about 17% over 1936-37. Some 4000 hours of this total was on civil government and other operations; the balance was on preliminary, individual, service and army-navy co-operation training.

C. Training

All types of training - preliminary, individual flying, service, and army-navy co-operation - increased appreciably during 1937-38. The greatest expansion was in preliminary training carried out by the Non-Permanent squadrons which was more than doubled, rising from 2402 hours in the previous year to 5082 in the current year. Seven squadrons were now engaged in flying training, Nos. 110, 111, 112, 115, 118, 119, and 120, the last named (at Regina) achieving a record of 1000 hours in its first year. In addition to preliminary training at their urban airfields throughout the year, Nos. 110, 111, 112 and 119 had two weeks in summer camp at Camp Borden, Sea Island or Shilo for service training in their respective roles. Nos. 115, 118 and 120 did not attend summer camp. The two new squadrons, Nos. 113 and 121, had not yet started training.

Service training according to programs based on RAF syllabi was carried out by five Permanent squadrons, Nos. 1, 2, 3, 4, and 5, for a total of almost 4410 hours.(22) No. 1 (Fighter) at Trenton and No. 2 (Army Co-Operation) and No. 3 (Bomber) at Rockcliffe flew to Camp Borden for their annual gunnery and bombing practice, including air-to-ground firing and high level and dive bombing. Nos. 4 and 5 Squadrons at Vancouver and Dartmouth did coastal reconnaissance training. No. 2 Squadron received practical training in active co-operation with Militia units attending summer camp in eastern and western Canada, and on the two coasts Nos. 4 and 5 also did some exercises with the Navy and the Army. The total flying on these co-operation exercises was 448 hours, of which the greater part was done by the "Atlases" of No. 2 Squadron.

Individual flying training, amounting to 5815 hours or almost 1000 hours more than in the previous year, was now centered chiefly at Trenton where the Flying Training School had been moved from Camp Borden on the completion of the 1936-37 courses.

On 5 July 1937 a new intake of 13 pilot officers (provisional) began ab initio training at Trenton.(23) One of the trainees, P/O (P) R.L. Doucett, was killed in a flying accident at Trenton on 18 October 1937 when his Fleet collided with another flown by F/L J.A. MacInnis with PS E.F. O'Connor as pupil; the crew of the second Fleet also lost their lives in the crash. The other twelve members of the course, P/Os (P) L.G.G.J. Archambault, L.J. Birchall, F.S. Carpenter, J.C. Fee, J.R. Frizzle, J.T. Gutray, H.R. McBurney,

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(22) No. 6 (Torpedo Bomber) Squadron, which was just beginning to get its "Shark" aircraft, did not do any service training. Nos. 7 and 8 (G.P.) Squadrons at Rockcliffe were engaged on civil operations and test work.

(23) One trainee had one summer's previous training in 1931. At the same time there was an intake of nine pilot officers (provisional) in the Non-Flying List, two of whom subsequently transferred to the General List. The others were trained as supply officers.

E.C. Sheffield, W.H. Stapley, R.B. Wylie, N.S.A. Anderson and A.B. Searle, graduated in May 1938 together with R.F. Douglas, a former Non-Permanent squadron officer who had joined the course in December 1937. All the graduates subsequently served with the Permanent Force.

When this course was half-way through its training a second intake of 26 started instruction at Trenton on 3 January 1938. This group included 15 who were in a special course of ab initio training for candidates for commissions in the RAF under the new "Trained in Canada" scheme.(24) The course ended on 18 October with 18 of the trainees receiving their flying badges; another received his wings a month later. Nine of the pilots then received appointments to the RAF - J.C. Campbell, R.M. Cox, A.A. Deacon, T.P. Harnett, W.B. Hodgson, D.M. Illsley, H.F. Marcou, H.P. Melanson, and C.A. Ross.(25) The other ten graduates, R.D.P. Blagrave, T.G. Fraser, K.A. Gordon, J.B. Harvey, G.A. Hiltz, K.L.B. Hodson, A.N. Martin, E.M. Reyno, J.A.D.B. Richer, and J.P.J. Desloges, served with the RCAF Permanent. Another member of the course transferred to the Non-Flying List.

Two courses of airmen pilots were also trained during this period. On 26 May 1937 Sgts. W.G. Pate, R.L. Davis and W.J. Michalski received their wings at Camp Borden, and a year later (20 May 1938) the second course graduated at Trenton with twelve successful candidates - E.R. Austin, K. Birchall, C.E. Briese, J.J. Cotter, R. Dobson, G.O. Godson, R.R.B. Hoodspith, V.A. Margetts, R.F. Milne, A.W. Mitchell, R.H. Morris, and F.H. Pearce.

In addition to ab initio flying training Trenton also gave courses in navigation, instrument flying, seaplane conversion, flying boat, and army co-operation.(26) Flying instructor courses were given at Camp Borden and Trenton, and photographic courses at Ottawa and Trenton. Parachute courses were given at Trenton, Winnipeg and Vancouver, armament courses for airmen at Camp Borden, and signals courses at Trenton. An innovation in the training program this year was an automatic pilot course given at Ottawa.

In No. 1 Technical Training School at Trenton 193 airmen were trained as storekeeper, W/T operator, armament artificer, motor mechanic, motor boat crew, fabric worker, photographer, machinist, meteorologist and coppersmith, while the new No. 2 T.T.S. at Camp Borden gave courses for 185 airmen training as fitters and carpenters. No. 1 Aircraft Depot at Ottawa trained 13 airmen on the "Cyclone" and "Jupiter" engines.

For the Non-Permanent, Trenton conducted initial armament and army co-operation courses for 19 officers, and six more officers

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(24) While under training these candidates were pilot officers (provisional) on the General List of the RCAF Non-Permanent.

(25) One other member of the course, E.F.J. Charles, also joined the RAF, although he apparently did not win his wings in Canada.

(26) F/O J.L. Henning, a graduate of the 1936 P/O (P) course, lost his life in the crash of a "Vedette" at Trenton on 4 August 1937. The flying-boat stalled at 300 feet and crashed out of control as the pilot was coming in for a landing; the crewman was seriously injured.

and six airmen took a photographic course at Rockcliffe.

For the Permanent and Non-Permanent Militia there were the annual senior army and air liaison officer courses at Trenton, attended by 41 Army and three RCAF officers. To assist the RCMP, who were establishing their own aviation section, the RCAF conducted three courses at Trenton for air navigation and instrument flying, air engineers, and parachute rigging; nine pupils were trained. Re-categorization tests were carried out for 36 civilian flying instructors.

Training of personnel outside RCAF facilities continued in increasing numbers. Eight airmen attended courses given in Canada by the Ford Motor Company, Dominion Oxygen Company, Armstrong Siddeley, and Pratt and Whitney engine manufacturers, and eleven more were sent overseas for training. Five airmen (Cpl. V.H.L. Schroeder, LACs A.A. Kempster, J.B. Barker and A.R. Brazier, and ACI F.R. Saunders) went to the RAF Electrical and Wireless School at Cranwell early in 1938 for training as instrument makers and repairers. WO E.C. Tennant and FS W.F. Tourgis completed the armament instructors course in the Air Armament School at Eastchurch, and Sgt. H.L. Taylor and LAC R. Inglis took a torpedo fitters course at Gosport. Cpl. K.S. Heathorn qualified in the automatic controls course at Henlow. Another aiman received training in the Armstrong Siddeley plant.

In addition to the airmen there were 12 officers on courses abroad. G/C G.O. Johnson qualified for "i.d.c." at the Imperial Defence College, and F/Ls A.L. James and W.D. VanVliet graduated with the fifteenth course from RAF Staff College. F/L R.C. Hawtrey was attending the RAF School of Aeronautical Engineering at Henlow, F/L C.R. Dunlap and F/O R.A. Cameron the Air Armament School at Eastchurch, F/O M.M. Hendrick the Electrical and Wireless School at Cranwell, and F/L W.E. Bennett qualified in a special course at the RAF Photographic School at Farnborough. Other officers were at the Army Co-Operation School, the Engineer Torpedo Course at Portsmouth, and an explosives course at Altrincham. In preparation for the introduction of Link trainers into the RCAF F/L F.R. Miller took a Link Aviation Trainer Course given by the U.S. Department of Commerce at Washington, D.C., in June 1937.

There was another exchange of officers with the RAF in April 1937, S/L F.A. Sampson and F/Ls R.C. Gordon and E.A. McNab proceeding overseas for a two-year tour, while F/Ls J.A. Easton, W.P.G. Pretty and L.F.J. Taylor came out to Canada. F/L Taylor was killed in flying accident at Trenton on 20 November 1937 when the wing tip of his Fleet struck the water while he was making a turn at low height. He was replaced by F/L E.A. Springall.

Signals

The service was still short of personnel in the signals branch and training in the Wireless School at Trenton was hampered by lack of adequate accommodation and equipment. A building was being constructed there to remedy the situation.

Progress had been made in the re-equipment of the service. Most of the air and marine craft in squadrons and schools using wireless had been supplied with sets of recent RAF design, and modern ground station transmitters and receivers had been provided for all service squadrons of the Permanent Force. The NPAAF, however, was not so well off. The army co-operation squadrons were equipped with ground and aircraft sets of "semi-modern" design,

but the other squadrons had not yet been equipped with aircraft wireless sets, pending the receipt of new types of aircraft; in the interim arrangements had been made to supply these units with semi-modern ground station sets so that they could carry out point-to-point practice.

Plans had also been made to equip the stations at Vancouver, Ottawa and Dartmouth with powerful transmitters for communication with aircraft and point-to-point with other RCAF units where such communication was not already available. Direction finding equipment for aircraft and ground stations was also on order and was expected to be in use the following year.

Commercial type transmitters and receivers were used on the aircraft of detachments engaged on photographic operations during the year; the detachments also had ground stations of similar type for communication with the aircraft and point-to-point operation. These sets contributed materially to the success of the year's work, saving both time and expense.

Armament

As mentioned previously a special branch had been formed at AFHQ to deal with armament and there was much activity in this field during the year.(27) To remedy the lack of adequate training facilities, construction of an air firing and bombing range was begun at Trenton for practice bombing, live bombing, air-to-ground firing, and air-to-air firing at towed targets. "There will then be no limit, given the necessary equipment, to the types of modern armament training which can be undertaken there."(28)

To arm the service some of the latest marks of Vickers machine-guns were delivered during the year, and at the same time steps were taken to re-equip with a new weapon, the Browning. One Browning was received for service trials and more were on order; it would be a considerable time, however, before the Vickers was replaced by the new type. For the bomber aircraft electro-magnetic bombing gear and the latest type of course-setting bomb sights were purchased; and in preparation for the move of the torpedo-bomber squadron to the west coast the Royal Canadian Navy transferred a number of torpedoes to the RCAF for conversion to aircraft use, while two RCAF mechanics were attached to the armament depot at Esquimalt for training in torpedo work.

Equipment and Development

This division was also much concerned with armament matters. Armament training involved a large turn-over in .303 ammunition links for Vickers and Browning machine-guns and 11½-lb. practice bombs and, to release the RCAF from dependence upon RAF sources, now fully occupied in meeting their own requirements, orders were placed for the manufacture of these items in Canada. Tentative steps were also taken to explore the possibility of manufacturing other armament stores within the Dominion.

During the year orders were placed for 104 new aircraft

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(27) It is significant that this was the first year since the RCAF had been formed that weapons received direct mention in the Air Force section of the annual departmental report.

(28) D.N.D. Report 1938; p.102.

and 168 aircraft engines. Two 38-foot motorboats and three service type dinghies were delivered from contractors in Canada.

To facilitate supervision at manufacturing plants and to safeguard the department's interests in equipment contracts, technical detachments were formed at Montreal and Toronto, each being in charge of an RCAF engineering officer under the direction of the Directorate of Air Development. A third detachment was to be located at Vancouver in 1938.

Close collaboration continued with the National Research Council on investigations such as research on ski gear for aircraft, type testing of aero engines, and x-ray examination of aluminum alloy castings.

Engineer services

Expenditures on engineer services from RCAF funds totalled $2,019,894.48, or almost three times as much as the previous year. The major items were for Vancouver ($722,374) and Trenton ($682,817). At Vancouver the Jericho Beach station was improved by the construction of two hangars, a bulk-head wall, slipway and apron, and a barrack block was nearly completed; more property was also acquired for the expansion of the station. At Trenton an air firing and bombing range was constructed, quarters for single officers, married officers and married airmen were completed, a stores and wireless building, NCO's and airmen's mess, barrack block, boiler house, guard house, test house and garage were nearly completed, and construction of a station hospital was started. Improvements at Rockcliffe included the acquisition of more land, the completion of married quarters and airmen's barrack block, and reconstruction of existing buildings to provide a supply depot and a hospital. At Dartmouth various facilities were extended, a power house, workshop and stores building were erected and a landing field was cleared adjacent to the seaplane base.

For future development and expansion 408 acres were acquired, cleared and graded for an aerodrome at Yarmouth, preliminary surveys were made of aerodrome sites at Sydney and Truro, land was acquired for a barrack site and aerodrome at Calgary and a magazine site at Kamloops. Training quarters were also acquired for the two Montreal NPAAF squadrons at 4450 Sherbrooke Street West and 4895 de Bullion Street.

The aerodrome at Victoria Beach in Manitoba, once the centre of much civil government flying, was transferred to the Department of Mines and Resources, and 46 civil aviation landing fields and radio beacon sites were turned over to the Department of Transport.

Medical services

Five officers and 13 other ranks of the RCAMC were attached to the RCAF on full time duty. Two RCAMC officers took special training with the RAF medical service. In addition to carrying out 580 medical examinations of RCAF personnel, the medical officers also examined 164 candidates for short service commissions in the Royal Air Force. There were nine deaths in the service during the fiscal year. Seven were the result of flying accidents - the first suffered by the Force since late in 1934; the others were due to a motor car accident and natural causes.

Survey of industry

The tri-service committee that was surveying actual and potential sources of supply of military equipment in Canada made considerable progress. Over 700 plants were surveyed, their facilities recorded, and deficiencies of equipment or material noted.

Coronation of H.M. King George VI

A highlight in the history of the RCAF in 1937 was its representation in the coronation ceremonies for King George VI on 12 May. A detachment of eight officers and 22 airmen was selected from units of the PAAF and NPAAF. W/C Harold Edwards from No. 5 Squadron at Dartmouth was in command with S/L A.H. Hull from Trenton as adjutant and F/L H.S. Ivey from Camp Borden as stores officer. The commanding officers of the five senior Non-Permanent squadrons were also included: S/L A.D. Bell-Irving (No. 11 Squadron, Vancouver), who was also second-in-command of the detachment, S/L W.A. Curtis (No. 10 Squadron, Toronto), S/L J.A. Sully (No. 12 Squadron, Winnipeg), S/L F.S. McGill (No. 15 Squadron, Montreal), and S/L M.C. Dubuc (No. 18 Squadron, Montreal). The Permanent Force airmen were WO1 L.J. Dyte, WO2s G. Moon and W.M. Pearce, FSs C.F. Bennett and H. Cobb, Sgts. L.J. Brown and T.F. Cooper, Cpls. T.J. Sullivan, H.L. Taylor, K.S. Heathorn, R. Cushley, J.A. Fortey and T.A. Spruston, and LACs J.B. Furnish and W.G. Webber. From the Non-Permanent came Sgts. R.J. Ounsted and J.H. Pickering, Cpls. H. Bennett and C.H. Crosskey, and AC2s J.G. McIndoe, T.M. Shadbolt and T. Vanchuk.(29)

D. Operations

In 1937-38 Civil Government Air Operations decreased to about one-half the amount of the previous year. The preventive service on the east coast had now been taken over by the RCMP; the forestry patrols in Manitoba and Saskatchewan were no longer flown by the RCAF, and only photography and transportation remained as the Force's civil government tasks. The total time flown on these tasks for other departments was 2360 hours, as compared with 4686 hours in 1936-37. Transportation flying diminished sharply to 553 hours, but photography increased by about one-third to a total of 1807 hours. Ninety per cent of the civil flying was done by RCAF Station Ottawa, including all the photographic work and the greater part of the transportation.

Under the direction of the Interdepartmental Committee on Air Surveys and Base Maps (chairman Dr. Camsell of the Department of Mines and Resources; secretary Mr. A.M. Narraway) a large program of air survey was prepared and detailed technical instructions were issued. To carry out the operations No. 8 (G.P.) Squadron (S/L C.R. Slemon, C.O.) at Rockcliffe sent out four detachments, each equipped with two aircraft and supported by another transport aircraft when required for work in unsettled areas. Although fewer aircraft were employed on aerial photography than in earlier years (at one time 22 machines had been out with the photographic detachments), it was hoped that, by the use of more modern aircraft of much improved performance and the use of the latest type of film, it would be possible to meet the

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(29) See AFO 85/37.

requirements of the various departments. Poor weather, however, greatly hampered activities during the early part of the season and by the middle of September only 230 rolls had been exposed, slightly more than one-half of the amount that had been anticipated if conditions had been favourable. Nevertheless by the end of the year 67,850 square miles (358 rolls) had been photographed for the Interdepartmental Committee and an additional 7,109 square miles (90 rolls) for the Geographical Section, General Staff. The total of almost 75,000 square miles in 1807 hours compared very favourably with the 76,000 square miles done in 4821 flying hours in 1931.

The largest photographic operation was in the drought area of the prairie provinces where, at the request of the Department of Agriculture, several detachments of Bellancas were engaged. The areas covered included the Frenchman and Souris river watersheds, Youngstown, Alta. and Regina, Sask. On the British Columbia coast a detachment of two Northrops was at work taking photographs required for defence planning in certain areas. In Western Ontario a large strip was photographed along the route of the proposed trans-Canada airway for which there were no detailed maps. Other operations covered parts of northern Quebec, Manitoba and the Northwest Territories.

The two new Fairchild Super 71s made their debut on photographic operations with No. 8 Squadron in northern Ontario at the beginning of the year, but much unserviceability trouble was experienced with them. Later in the year one of the Super 71s crashed at Grand Rapids, Man., on 6 August 1937, killing F/O C.H. Porter, the pilot, and LAC E.G. Doran, the crewman. The crew were en route to the east from Edmonton and were last seen when they passed over Grand Rapids at a low altitude that evening; the visibility was poor due to heavy smoke from forest fires.

The major transportation operation was a long distance flight for the Governor General, Lord Tweedsmuir, in August 1937, to carry him from Aklavik, N.W.T., to Cooking Lake, Alta., via Fort Norman, Great Bear Lake, Rae, Fort Smith and Chipewyan. Two Fairchilds of No. 7 Squadron were used, flown by F/L D.A. Harding and F/S A. Fleming. The aircraft left Rockcliffe on 25 July and returned to base a month later. When the Governor General visited British Columbia in September aircraft from RCAF Station Vancouver took him on a flight over Tweedsmuir National Park.

In addition to the operations for other departments the RCAF flew 1662 hours on transportation, test and development for its own requirements and some transportation for the Militia.

By the spring of 1938 the service (or the department) was becoming more security conscious than it had been in earlier years. The draft submission of the RCAF for the 1937-8 Annual Report contained a long item on aircraft establishment and types which was omitted from the published report. The item, part of the data on "Air Staff Division - Directorate of Air Operations, Plans and Organization", ran as follows:

Summary of Aircraft Establishment (in effect 31st March, 1938):- Owing to the difficulty in obtaining delivery of new aircraft, the aircraft situation is much the same as last year with the exception of primary training aircraft. Deliveries of new Fleet and Tiger Moth aircraft during the year have improved the situation slightly. The available aircraft can be classified as follows:-

Service Types	Remarks
14 Atlas	An Army Co-Operation type which is now obsolete. One of these is equipped with dual control for training only.
24 Wapitis	A two-seater general purpose bi-plane used for bombing and Army Co-Operation training. 18 not yet placed in Service (at contractors for overhaul).
7 Sharks	A modern type used for torpedo bombing and general reconnaissance duties.
6 Siskins	Single-seater fighters of a type which is obsolete. These will be replaced by a modern type.
4 Vancouver	A twin-engine flying boat originally purchased and used for Civil Government work and now modified for Service purposes. This will be replaced by a modern type flying boat.
Training Types	
7 Avro 621	A two-seater training type which has been adapted for Army Co-Operation training and is allotted to the Non-Permanent Army Co-Operation Squadrons.
3 Avro 626	A two-seater training type, designed to accommodate armament and equipment for almost all advanced training, allotted to the Non-Permanent Army Co-Operation Squadrons.
32 Fleet	A two-seater training type manufactured in Canada and used for ab initio training.
21 Tiger Moth	A two-seater training type manufactured in Canada and used for ab initio training.
25 Moth 60M	An obsolete two-seater training type manufactured in Canada.
2 Tomtit	An obsolete type used for practice flying purposes.

9 Vedette	A three-seater type flying boat, which was originally purchased for Civil Operational work, and is being retained in Service for flying boat training until other types become available.

Civil Operational and Transportation types	Remarks
8 Bellanca 7 Fairchild 51 16 Fairchild 71 1 Fairchild Super 71 7 Northrop Delta	These aircraft, with the exception of the Fairchild Super 71 and Northrop Delta, are obsolete, but are being retained in Service until replaced by new types. The Delta aircraft can be converted for Service flying.

During the year orders were placed for the purchase of several new aircraft, delivery of which is expected as follows:

Type	Anticipated Date of Delivery
9 Avro 626	September, 1938
9 Tiger Moth	April, 1938
19 Blackburn Shark	2 by June, 1938; 2 by January, 1939; 3 by April, 1939; 9 by January, 1940; 3 by April, 1940.
10 Stranraer	2 by June, 1938; 1 by July, 1938; 2 by August, 1938; 2 by October, 1938; 3 by summer, 1939.
18 Bolingbroke	1 by November, 1938; remainder by November, 1939.
12 Lysanders	1 by March, 1939; remainder by September, 1939.
1 Grumman	June, 1938.
13 Delta	2 by July, 1938; 2 by August, 1938; 2 by January, 1939; 7 by January, 1940.
11 Fleet	May, 1938.
4 Norseman	May, 1938.

DRAFT REPORT ON PROGRESS OF SERVICE TRAINING TO MARCH 31ST, 1938

PERMANENT FORCE UNITS

1. The training of permanent force units in service duties progressed satisfactorily during the year insofar as the state of their organization and equipment permitted. Little of the effect of this year's appropriation for the RCAF will be apparent in service training of units until the personnel taken in under the expansion scheme complete their preliminary training, the aircraft and equipment on order is delivered, and the accommodation under construction reaches a more finished state.

No. 1 (Fighter) Squadron (Siskin)

This unit was organized as a squadron with a headquarters and two flights during the present year. The personnel and aircraft coming from the Fighter flight which had been attached to No. 3 (Bomber) Squadron. Service Training has been carried out through the year, the unit completing their air firing and bombing practices and tests for the first time.

No. 2 (Army Co-Operation) Squadron (Atlas)

Full organization to a headquarters and two flights attained this year, the unit training increasing proportionately. The squadron completed their annual air firing and bombing practices and tests, which also afforded practice in the movement of the unit to another station and return. In addition considerable co-operation in the form of demonstration and exercises was afforded the Militia in both Eastern and Western Canada.

No. 3 (Bomber) Squadron (Wapiti)

The organization of this unit remained at a headquarters and one flight, but were allotted aircraft for the first time. They were able, therefore, to undertake their syllabus of service training, completing their initial air firing and bombing practices and tests.

No. 4 (General Reconnaissance) Squadron (Vancouver Flying Boats)

Beside carrying out service training, this unit has been engaged a great part of the time on reconnaissance, mainly comprised of survey duties in connection with the location of sites suitable for the development of sea and land air bases, and of collecting information regarding the topography and meteorological conditions prevailing on the West coast. These operations have provided valuable experience and data.

No. 5 (General Reconnaissance) Squadron (Fairchild Seaplanes)

This unit was engaged previously in Civil Government Air Operations. This work was discontinued in January 1937, and the unit reorganized on a service basis, being provided with a nucleus of personnel. In addition to service training they have carried out reconnaissance on the East coast for the location of sites suitable for the development of sea and land air bases. Also information regarding the topography and meteorological conditions of the areas mentioned. These operations have provided valuable experience. In addition, the unit carried out numerous exercises with both the Navy and Militia.

No. 6 (Torpedo Bomber) Squadron (Shark II)

This unit, a headquarters and two flights, was organized at Trenton during the year, receiving 6 aircraft and a nucleus of personnel. The remaining personnel are now receiving preliminary training. The unit has been engaged mainly in test flying and running in engines. In addition such items of training as could be conveniently worked in were included in the programme previously mentioned.

NON-PERMANENT FORCE UNITS

Nos. 110 and 112 (Army Co-Operation) Squadrons (Moths & Tutors)

These units advanced to service training, a special syllabus being provided, with the units carrying out such practices as their aircraft would permit. Both squadrons attended an annual Summer training camp of 14 days.

No. 111 (Coastal Artillery Co-Operation) Squadron (Moths & Tutors)

This unit had been carrying out army co-operation service training, but the designation of the squadron and the type of duties was changed from Army Co-Operation to Coastal Artillery Co-Operation in October. The unit is now proceeding with the latter type of training. The squadron attended an annual Summer training camp of 14 days.

SERVICE FLYING TIME

PERMANENT FORCE SQUADRONS	1936-37	1937-38
No. 1 (Fighter) Squadron	446.45	466.00
No. 2 (Army Co-Operation) Squadron	1047.10	1118.00
No. 3 (Bomber) Squadron	-	460.00
No. 4 (Gen. Rgconn.) Squadron	739.35	750.00
No. 5 (Gen. Reconn.) Squadron	39.45	220.00
No. 6 (Torpedo Bomber) Squadron	-	420.00
NON-PERMANENT SQUADRONS		
No. 110 (Army Co-Operation) Squadron	725.00	750.00
No. 111 (Coastal Artillery Co-Oper.) SQD	626.55	900.00
No. 112 (Army Co-Operation) Squadron	630.25	900.00
TOTAL	4255.35	5984.00

Chapter XXII

The Royal Canadian Air Force, 1938-39

A. Parliament

Defence matters figured very prominently in the 1938 session of Parliament. When the estimates for the Department of National Defence were first presented on 24 March Mr. Mackenzie gave the house a detailed statement on the "general principles of defence policy" in the Dominion. He began by tracing the evolution of defence policy as stated in the various Imperial Conferences to the present situation where each self-governing dominion was primarily responsible for its own local defence and any military action was for the individual decision of each government. The Imperial Conference of 1937 (1), he pointed out, had again "recognised that it is the sole responsibility of the several Parliaments of the British Commonwealth to decide the nature and scope of their own defence policy." (2) In Canada there were several schools of thought about defence-imperialist, isolationist, League of Nations collectivist, and North American collectivist, as well as a moderate middle group who believed in no automatic commitments for either military action or neutrality.

After analysing the naval and army expenditures for 1937, the minister turned to the air services and described the progress that had been made during the previous year in the expansion and re-equipment of the RCAF. The expansion, he noted, was chiefly for the completion of existing units, rather than the creation of new ones. More than 100 new aircraft and engines had been ordered, "a substantial increase" had been made in the reserves of bombs and ammunition, and a very extensive construction program had been undertaken, particularly on the two coasts. The NPAAF had also expanded, although "in certain places the program has been somewhat delayed by the lack of proper training accommodation." On the other hand, civil government air operations had decreased, the major task now being aerial photography with some supply transport work.

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(1) The conference met in London on 14 May 1937, immediately following the coronation, and continued until 15 June. Mr. Mackenzie was one of the Canadian delegates, and A/C Croil, the Senior Air Officer, was included in the staff of advisers.

(2) Imperial Conference, 1937: Summary of Proceedings (Cmd. 5482); p. 20.

Turning to the defence estimates for the 1938-39 year, the minister said that the appropriation had two purposes: to preserve Canadian neutrality, and to defend the Canadian coast line, ports and terminals, and focal areas of our trade routes. After deliberation of defence requirements "a certain amount of priority" had been established in which first place was accorded to the air services, second to the navy, and third place to the repair of deficiencies in the equipment of the militia. The navy, however, was the only service that received an increase in 1938, the total national defence vote being $2,000,000 less than for the previous year, partly because of a reduction in new aircraft purchases, partly because of the progress made in the construction program, and partly because of difficulty in getting deliveries of equipment already on order. (3)

For the RCAF the appropriation proposed in the main estimates was $10,753,617, roughly $1,000,000 less than the previous year. The decrease was accounted for largely by the fact that only 75 new aircraft were being ordered (4) as against 102 in the previous year. Personnel strength, however, would be increased by almost one-third to permit "the partial organization and development" of two additional Permanent and three Non-Permanent squadrons. "Thus, by the end of the year Canada will have in being, ten permanent force squadrons and twelve non-permanent force squadrons, or a total of 22 air squadrons, although these will not by that time be fully equipped and manned. (5) It will be seen, therefore, that we are approaching very closely to the objective indicated in the debate a year ago of 23 squadrons, eleven permanent and twelve non-permanent." When aircraft on order had been delivered the Air Force would have 102 modern service types as partial equipment for the ten permanent squadrons, 62 trainers for the PAAF, and 60 more trainers of various types for the NPAAF squadrons. During the year development would be carried out on air bases at Patricia Bay, Alliford Bay and Prince Rupert on the Pacific coast, and Dartmouth, Yarmouth, Truro and Sydney on the Atlantic coast; a new magazine would be completed in the interior of British Columbia, another would be constructed near the Atlantic coast, and substantial additions would be made to the reserves of service ammunition.

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(3) For example, of the 102 aircraft ordered in 1937-38, only about 60, mostly light training machines, had been delivered by the end of the fiscal year.

(4) Fifty-five for the PAAF and 20 for the NPAAF.

(5) At 31 March 1939 only eight PAAF squadrons were actually in being, and eight NPAAF; four more Auxiliary squadrons had been authorized.

After sketching the year's program for the RCAF, the minister added

> "....one word with reference to the functions of the air force in connection with the government's program. A well equipped and efficient air force is, in my opinion, of primary importance for the protection of Canadian territory and waters, and in view of the rapidly increasing performance of modern aircraft the possibility of attack by such means is to-day a probability. Apart from its value as a highly mobile striking force capable of rapid concentration at any point in Canada, it is also required to assist the other services in their particular role of defence: in the first place, independent air action against enemy aircraft and bases, and air action in conjunction with ground anti-aircraft defences of important localities; in the second place cooperation with naval forces in the protection of trade routes and focal points of shipping; and thirdly, co-operation with the militia by observation of coast artillery fire and assistance in the suppression of enemy landings and raids." (6)

Following this detailed exposition by the minister, many members rose to express their views on the general policy of defence, on isolationism, imperialism and collectivism; and once again the cry was raised "against whom are we arming?" Some objected to imperialism and foreign wars and declared that defence should be for Canada only and in Canada only. Mr. MacNeil criticised the priority given to the air force; others were suspicious of preparation for external wars and of commitments stated or implied. This point of view was represented by Miss MacPhail who, in expressing her fear of Canada "being drawn into a world conflict which is none of our doing", said that in her opinion "our British connection is our gravest danger."

But there were other members who asserted that Canada was entirely dependent on the motherland for protection. Some spoke of the danger of air bombardment; Mr. Green criticised the lack of defences on the Pacific coast and Mr. Slaght advocated a more liberal expenditure on the air service. Mr. Denton Massey also urged a stronger air force and the development of the aircraft industry in Canada,

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(6) Mr. Mackenzie then turned to the militia estimates which showed a reduction of $2,750,000 and, examining the "actual problems before a general staff with reference to the defence of Canada", he presented a good analysis of the dangers and the plans to meet them. Hansard, 1938 Session; Vol. II, pp. 1642-51.

while Mr. MacNicol, taking a very far-sighted view, advocated the establishment of an air raid defence organization. (7)

By this time, in six sittings of the House, the debate on the first item in the defence estimates (departmental administration) had filled 125 pages of Hansard and Mr. Mackenzie allowed the item to stand to permit further discussion later. The House proceeded to consider other items in the estimates and on 16 May those for the air services came before the committee of supply. After so much debate in the previous weeks the air estimates were agreed to with little further discussion. The total appropriation of $10,753,617 was subdivided into three items - $9,410,567 for the Permanent Force, $987,050 for the Non-Permanent, and $356,000 for Civil Government Air Operations. Much of the minister's explanation of the estimates was an amplification of his previous statements about construction expenditures, strength of the force, and other matters, with a detailed account of the aircraft situation. At the end of the 1938-39 fiscal year, Mr. Mackenzie said, the RCAF would have 203 aircraft, 66 of which would be service types and the other 137 training, transport or photographic types. The service aircraft included 24 "Wapiti" and "Lysander" bomber and army co-operation machines, 16 "Shark" torpedo-bombers, 11 "Vancouver" and "Stranraer" flying-boats, 8 "Bolingbroke" coastal reconnaissance aircraft, and 7 "Lysander" fighters. (8) Most of these aircraft were being obtained on "cost plus" contracts let by the government to the Fairchild Company in Montreal (for the "Bolingbrokes"), the Ottawa Car Company in Ottawa (reconditioned "Wapitis"), the National Steel Car Company in Hamilton ("Lysanders") and the Boeing Company in Vancouver ("Sharks"). For training there would be 43 Fleet, 26 "Tiger Moth", 12 Avro 626 and 7 Avro 621 aircraft, while the "civil" fleet for photographic and transport operations would comprise 20 "Deltas", 16 Fairchild 71s, 4 "Norsemen", a Fairchild Super 71, and 8 obsolete Bellancas.

In reply to a request from Mr. Woodsworth for "some idea as to the purpose of our air force in Canada", the minister emphasized that its role was defensive - "to co-operate with the naval and militia services for the defence of Canada in the case of an emergency."

For Civil Government Air Operations the appropriation of $356,000 was a reduction of $5,000 from the previous year. The minister described the plans for the 1938 season, mostly photography in the northwestern part of Canada for which "Delta" aircraft were now used. (9)

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(7) Ibid.; Vol. II, pp. 1651-88 (24 March 1938), pp. 1706-12 (25 March, afternoon sitting), pp. 1719-37 (25 March, evening sitting), pp. 1922-46 and 1953-68 (1 April), and Vol. III, pp. 2871-90 (13 May).

(8) The minister identified only one type, the "Stranraer", by name. Actual deliveries lagged behind anticipation; for example, no "Lysanders" or 'Bolingbrokes" had been received by 31 March 1939.

(9) Hansard, 1938 Session; Vol. III, pp. 2931-39.

After the main estimates had been passed two supplementary estimates were presented, asking foran additional $884,900 for the Permanent and $48,000 for the Non-Permanent Air Force. Both items consisted almost entirely of "revotes" for equipment or construction for which contracts had been let but deliveries not yet received. The equipment included airframes, engines and spares ($424,000), bombs and ammunition ($50,000), W/T equipment ($33,000), and miscellaneous stores ($72,000). Most of the construction expenditure was to be at Trenton, Patricia Bay, Vancouver and Dartmouth. (10) With these supplementary items the total appropriation for the air services in 1938-39 came to $11,686,517, or $66,133 less than the previous year. In the last week of the session another matter came up which led to a sharp exchange between the prime minister, Mr. Mackenzie King, and the leader of the opposition, Mr. Bennett. The subject was first raised on 24 June when Mr. C.G. MacNeil, the CCF member for Vancouver North, asked "what are the intentions of the Department of National Defence with respect to the proposals that training centres for aviators be established in Canada by the British government, and what steps have been taken to aid recruiting for the Royal Air Force?" The prime minister replied that "the question.....is really one of government policy..... it is not usual to make statements of government policy in reply to questions on the orders of the day...." Mr. J.S. Woodsworth, the CCF member for Winnipeg North Centre, then asked when the prime minister would divulge the government's policy to the house, and was told that "any statement of policy in regard to the matter referred to will be made if and when occasion for such arises." (11)

The subject did not rest there. A week later, on the last day of the session (1 July), when the House was again sitting in committee of supply and debating national defence policy, Mr. Bennett referred to the establishment of training grounds for aviators in different parts of the empire outside the United Kingdom and said:

> "The information I have is that the British government was desirous of finding here an opportunity for the training of flyers and aviators, because of our climatic and other conditions that made such training possible, as compared with the limitations imposed upon them by reason of the density of their population and other matters of that kind. What I was anxious about was whether the government would not be very greatly concerned to assist in this being done, not only because we are a part of the British Commonwealth of Nations but also because it would enable us to derive the benefits that would come from such an arrangement."

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(10) Ibid,; Vol. IV, pp. 3552-56.

(11) Ibid.; p. 4214. On 15 May 1938 a party of RAF officers and Air Ministry officials had arrived in Ottawa to explore the possibility of having Canadian manufacturers produce aircraft for the United Kingdom.

Mr. Mackenzie replied that in examining the departmental files on the subject he had found that an editorial in the Vancouver "Sun" on 7 July 1937 had charged that the Canadian government had "rather fumbled the issue" by refusing permission to Great Britain to establish RAF training stations in Canada, although it would permit the British to recruit Canadians for training in the RAF. He had made inquiry of the Senior Air Officer who replied that he had been unable to trace the authority for that statement and further that "a search of central registry has failed to reveal any request by the Air Ministry for authority to establish a training station in Canada. No one in this office has any recollection of having seen correspondence dealing with such a request." Mr. Bennett interjected "I would not expect there would be."

The minister continued that the other day he had made further inquiries "and the situation is still the same."

> "As a matter of fact I want to say that in regard to the training of Canadians, and preparing them for commissions in the air force in Great Britain, we have met every request. We are sending 120 a year to Great Britain, and training some at Trenton - fifteen at the present time - who will later proceed to Great Britain and take commissions for reserve in the Canadian air force.
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> "This insidious compaign outside - not in the house - that there has been a lack of willingness to cooperate, I say is absolutely false in every word. There has been absolutely a full spirit of cooperation, and I would ask the Prime Minister, if he will, to read a letter which came from the British government the other day indicating their appreciation of the cooperation extended to the recent air commission in Canada."

Before reading the letter, Mr. Mackenzie King said he was "somewhat surprised" that the leaders of the opposition in the house and senate "assert that they have information with respect to conversations which have taken place between the British government and the Canadian government, because I am unable to gather from what source information of that kind could have come." Mr. Bennett retorted: "I did not say that. I said I had information that they had endeavoured to establish training schools in this country. I was sensible enough to know that they did not make any formal discussions what the attitude of the government was." He declined, however, Mr. King's invitation to tell the committee the source of his information "so we may judge how authentic" it was.

After some words about "an old Tory trick" to misrepresent the position of the government the prime minister sought to "clear up the matter once and for all" by reading a letter of 21 June 1938 from the United Kingdom High Commissioner in Ottawa in which Sir Francis Floud conveyed "an expression of the warm appreciation of His Majesty's government in the United Kingdom for the valuable assistance rendered by the Minister of National Defence and his department to the air mission from the United Kingdom which recently visited Canada."

This diplomatically correct but empty letter did not clear up the matter, however. Mr. Bennett noted that it referred to an earlier communication from the Canadian government of 16 April and, charging that the prime minister should not read a reply to a letter without also reading the original letter, asked that it be produced. Mr. King agreed to send for it, but said there was "nothing in the other communication which would affect or alter in any way the significance of the present communication."

The prime minister then proceeded to make a statement which revealed his attitude to the establishment of training stations in Canada if a formal proposal were made. He began by saying that the government had nothing to add to the statement made by its leader in the senate "to the effect that no requests have been received from the British government for the establishment in Canada of training centres for aviators of the air force of the United Kingdom. Confidential and informal exploratory conversations with respect to training of British air pilots have taken place, but nothing has developed which it was felt warranted a statement of policy. As has been indicated, if any proposals are made by the government of the United Kingdom, the Canadian government would of course be prepared to discuss them with that government and to make its position known to the Canadian people and to parliament." (12)

Mr. King then referred to a statement by the British government that the governments of the Dominions had been kept informed of the rearmament program in the United Kingdom, and that the possibility of placing orders in Canada was under examination, some orders having been placed in certain cases in which suitable terms, including times of delivery, could be arranged. This, the prime minister added, indicated what the British government wished to give in the way of information on matters which had been the subject of confidential communication between the two governments.

The prime minister then continued:

> "May I say a word with respect to the idea of having the Imperial air force set up flying schools in Canada to train their pilots; in short, a military station put down in Canada, owned, maintained and operated by the imperial government for imperial purposes. (13) I must say that long ago Canadian governments finally settled the constitutional principle that in Canadian territory there could be no military establishments unless they were owned, maintained and controlled by the Canadian government responsible to the Canadian parliament

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(12) It seems probable that in the course of these "confidential and informal exploratory conversations" the British air mission became aware of the prime minister's views about training fields and in consequence carefully avoided any formal request; naturally there was nothing in official departmental files.

(13) I.e. - as was done by the RFC/RAF in 1917-18.

> and people. In the end the imperial naval stations and army garrisons were withdrawn and Canadian authority took over. A reversal of that principle and that historical process at this date is something the Canadian people would not for a moment entertain. Such domestic ownership, maintenance and control of all military stations and personnel is one of the really indispensable hall marks of national sovereign self-government and an indispensable basis for friendly and effective cooperation between the governments of Canada and those of other parts of the British commonwealth of nations, including the government of the United Kingdom. Outside its homeland a state may have military stations and quarter military personnel in countries which it "owns", in its colonies or "possessions", or in its mandated territories according to the trust deed, or in countries over which it has assumed or been yielded, by some arrangement, what amounts to a protectorate. But no country pretending to sovereign self control could permit such a state of affairs or its implications and consequences. I need only add that what I have said has, of course, to be sharply distinguished from the case of actual war where a country may have to permit its partners, associates or allies to maintain, operate and control military establishments and forces within its territory, forced to do so by the actual strategic or tactical necessities and for the purposes, but only for the purposes, of the actual joint war."

In reply to a member who inquired about Canada's obligations for the defence of the naval bases at Halifax and Esquimalt should the United Kingdom be involved in war, the prime minister repeated "what I have said time and again, namely, that there are no commitments of any kind on the part of this government with respect to any war in which the United Kingdom may be engaged. What may be done will be done as a result of the action of this parliament."

Mr. Bennett sharply challenged the prime minister's stand. "I would be derelict in my duty if I did not say at once that I wholly and entirely and utterly disagree with that statement. When the ancient partner upon whom we have leaned all these years is not to be permitted to provide effective means for maintaining, not her life but the life of an empire and commonwealth, then I say it is time for us to take stock of the situation.....To say that any partner in our commonwealth should not, if it so desired, be given every opportunity to establish training fields for the safety, not of themselves but of the commonwealth, is destructive of the whole theory of 1926 and 1930. We said that we were freely associated with one another, that we were partners, and now we are told that if we try to act as partners we will be violating some unheard of national right."

When Mr. King retorted that there was nothing in his statement to justify any such inference the leader of the opposition insisted:

> "It justifies no other inference than that. It can be interpreted in only one sense. The language is clear, it is unambiguous - for a change. But, sir, I do not believe that the people of this country share that view. Every man who has read the history of modern warfare and knows what is being prepared realizes that the bombers of to-day will make the British Islands the very forefront of attack in the next war. They are threatened, and where are they to prepare for their defence, which is our defence? Not in those little islands. And if they want to come here and train and prepare to send their bombers across the ocean if the occasion arises, should they not be permitted gladly to do so and be welcomed? For what they are saving is our civilization, and Canada-and Canada, I repeat.....And to-day we are told that it is inconsistent with our national sovereignty that the Dominion of Canada should permit training fields and centres to be established here by one of our partners for the defence of our common empire, a commonwealth of nations."

Mr. Mackenzie King: "We establish our own."

Mr. Bennett: "We have not the facilities to establish our own to offer to them.....And now we are told it would be inconsistent with national sovereignty that we should permit a partner to provide for a contingency that means our life. Do not let us have any misunderstanding about it. When Britain goes, we go. Who stands if freedom fall; who dies if England lives? If it was the last word I ever uttered in this house or with the last breath in my body I would say that no Canadian is worthy of his great heritage and his great traditions and his magnificent hope of the future who would deny to the old partner who established us the right in this country to create those centres which she may not have at home to preserve her life and the life of every man who enjoys freedom and liberty under the protecting aegis of that flag." (14)

Mr. Mackenzie King: ".....the course above all others which serves to unite and which serves to keep united the British Commonwealth of Nations is that which is implied in the words "complete self-government on the part of each of the self-governing dominions" and self-government means control by the government of a country over its own military establishments.....We have in Canada our Department of National Defence; we have our army and

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(14) In point of fact this was Mr. Bennett's last appearance in the house as leader of the opposition.

> our air force and our naval service establishments as the British government have their army and navy and air force establishments under their own control and a responsible minister. You cannot have two military forces operating in individual countries responsible at one time or in part to the one government and at another time and in part to another government. We have to take complete responsibility ourselves with respect to everything we do and for everything that is done here.....I want the house and the country to understand clearly what is being discussed. My reference was with regard to the idea of having the imperial air force set up a flying school somewhere in Canada to train their flying pilots. In short, a military station to be put down in Canada, owned, maintained and operated by the imperial government for imperial purposes."

Mr. Bennett denied that it was for imperial purposes, insisting that it was for Canadian purposes - "very much so". The prime minister replied that Canada would look after her own defence in cooperation with other parts of the empire, and repeated that that cooperation would be most effectively maintained by each part managing its own affairs and being responsible to its own parliament for all its actions; he was quite willing to go before the Canadian people "at the appropriate time" and have the issue fought out.

Mr. Bennett said he was willing to go to the people too and added that the minister of national defence had stated that Canada was going to depend on the might of Britain "for our naval defence, and that means our life.....that means, the defence of Canada by the tax-payer of England, who is denied the right to train his men in Canada for the purpose of protecting that navy."

Mr. King took issue with that statement.

> "This government has never at any time said that it was not prepared to give in our own establishments the opportunity to British pilots to come over here and train, but they will do it in our own establishments, controlled by our own Minister of National Defence who is responsible to this parliament. That is an entirely different thing from having a branch of the British forces establish headquarters in this country, direct their own men here and be responsible, not to this parliament for what takes place in Canada as a consequence, but only to the British parliament and the British people."

Mr. Bennett started to refer to the military road to Yukon and Alaska "for an alien" and became involved in an argument as to who was responsible for statements about it. He then returned to his theme by asking:

"If it is essential that we should depend upon the British navy for our national life, is it inconsistent with our position of free association with the people who provide it that they should have an opportunity to establish a training school in Canada for those who will defend, not their country, but our common heritage with their navy upon which we depend, according to the minister himself? Everybody, I think, will agree with that, and I believe that the great mass of public opinion in this country would support that view."

Mr. Lapointe (Quebec East) entered the debate to ask whether the opposition leader would extend the same principle to the land forces, and Mr. Bennett tried to explain why he would not. The prime minister then sought to conclude the debate by saying:

"There is not a man in this parliament who believes more strongly in the British Empire and the part it is playing in the world to-day than myself. I believe that the British Empire can be kept together and made an effective instrument for peace throughout the world by effective cooperation between the self-governing dominions and the United Kingdom. But I do say that any reversal of the trend.....that has taken place in the last century with respect to military establishments.....would be a factor in dismembering the British Empire and would create all sorts of controversy and discussion in the country, serving no useful purpose in the end....."

Mr. Cahan asked whether the prime minister seriously suggested that affording facilities at the expense of the United Kingdom to give flying training to men who would ultimately be employed in the British air forces for the protection not only of the United Kingdom but of all the other dominions was a retrograde step. "The training of British air forces in Canada would be the first step, it seems to me, in cooperation.....(It) would not....imply the exercise of British military authority over this country...."

The prime minister replied that he would go a step further. "Whereas (Mr. Cahan) proposes that we should have the British government come and pay for establishments which they are supporting in this country for the training of pilots, we ourselves are prepared to have our own establishments here and to give in those establishments facilities to British pilots to come and train here. But they must come and train in establishments which are under the control of the government of Canada and for which the Minister of National Defence will be able to answer in this parliament with respect to everything concerning them."

Alleging that facilities at the present time were utterly inadequate for that purpose, Mr. Cahan asked whether the prime minister would seek adequate appropriations to provide ample facilities; if so he would "go a long way with him, but there has not been one practical step taken yet in that direction." Mr. King replied that when requests were received from the British government they would be considered, but none had been received up to the present for the establishment of training stations in this country. "We have had some exploratory conversations with respect to what might be desirable with a view to affording facilities for pilots to train, and we have indicated our position, as I have stated it on the floor of this house this morning, that we are quite prepared in connection with our own establishments, to help in affording facilities to British pilots if that will be of service to them....."

Mr. Bennett retorted that: "No British government, after the statement made this morning by the Prime Minister...., will ever apply to his government for permission to establish an air training school here.....No British government will face a refusal; and we have the refusal now, before application is made.....We have refused, not a military establishment, but a training ground. That is all that ever was thought of or suggested...."Mr. Lapointe (Quebec East) queried whether a training field was not a military establishment; what was it, a plaything, a church organization, or what?

The leader of the opposition ended the long debate with the words:

> "It is to coordinate their activities with the navy in order that our ports may be defended. Would you not train men here for flying if they were to co-operate with the British navy to defend Canada? Atmospheric pressure, weather conditions, everything that goes with flying out to sea or across the stormy Atlantic must be considered to enable us to cooperate with the British fleet, with the submarines, with the torpedo boat destroyers - all these things are involved. Train in Canada? Of course. Where else would they be able to do what the Minister of National Defence says he is relying on that navy to do, namely to preserve our commerce from destruction. That is the reason. There is no other training place they can go to. This is the only place they can do it and do it effectively to attain the end which the Minister of National Defence says must be attained."(15)

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(15) Hansard, Vol. IV; pp. 4523-32.

B. RCAF Organization and Strength

In 1938 major changes were made in the organization of the Royal Canadian Air Force and, as the culmination of these developments, the Force acquired a completely independent status. Since its reorganization on a permanent basis in 1924 the RCAF had been under the Chief of the General Staff of the Army. This subordinate status ended on 19 November 1938 when an order was issued that "the control and administration of the Royal Canadian Air Force will be exercised and carried out by the Senior Air Officer who will, in this respect, be directly responsible to the Minister of National Defence." (16) At the same time an Air Council was constituted, consisting of the Senior Air Officer, the Air Staff Officer, the Air Personnel Staff Officer, the Chief Aeronautical Engineer, and a secretary. (17) In keeping with the new independent status of the RCAF the title of the Senior Air Officer (A/V/M Croil) was changed a month later, on 15 December 1938, to Chief of the Air Staff, placing him on an equal footing with the heads of the other two services. (18) The grant of independence meant that the powers, duties and functions formerly exercised and performed by District Officers Commanding with respect to air force units in their districts were now transferred to the officers commanding the RCAF Air Commands. A few units, not yet allocated to an Air Command, remained temporarily under the administration of the local Military District, and several others continued to be administered directly by Air Force Headquarters as in the past.

There were now three Air Commands. Western Air Command, authorized on 1 March 1938, began to function at Vancouver under G/C Johnson, and on 15 September two more Air Commands were authorized and began to organize. The Training Group centred at Trenton became Air Training Command and moved its headquarters to Toronto, effective 1 October. G/C A.E. Godfrey was transferred from Trenton to take command of ATC on 17 October, but two months later he was posted overseas to attend Imperial Defence College and was succeeded by W/C A.A.L. Cuffe (16 December). On the Atlantic coast Eastern Air Command was formed with headquarters at Halifax, and G/C N.R. Anderson assumed command on 17 December. (19)

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(16) AFGO 2/38. It was at this time that the RCAF began publishing its own General Orders which hitherto had been published with Militia Orders.

(17) AFGO 3/38.

(18) AFGO 7/39, and PC 357 of 16 February 1939.

(19) Air maps on a scale of eight miles to the inch had been produced for the west coast and adjacent waters and were being prepared for the Atlantic coast and Gulf of St. Lawrence.

At Ottawa a separate RCAF Record Office was set up on 1 June 1938 (20) and within AFHQ a Photography branch was created in the Air Staff Division and a Directorate of Works and Buildings in the Equipment and Development Staff Division. Previously, when the RCAF was under the Army, the construction of airfields and facilities had been handled by the Army's Directorate of Engineer Services; now, with the new status of the RCAF and its great program of expansion, the force was developing its own organization for construction work.

Other changes during the year were the organization of the base at Dartmouth as an RCAF Station once again (1 April 1938), the establishment of No. 21 (Magazine) Detachment at Kamloops (1 April), the formation of No. 13 Technical Detachment at Vancouver (1 August), and the reappearance of the Test and Development Flight at Rockcliffe as a separate entity (1 December); for the past three years the test flight had been a part of No. 7 (G.P.) Squadron. Three more units were authorized on 1 April, No. 9 (General Reconnaissance) Squadron, No. 10 (Torpedo Bomber) Squadron, and No. 4 Repair Depot, but they did not actually form before the outbreak of war.

Four squadrons were moved to new locations during the year. Late in August No. 1 (Fighter) Squadron moved by rail from Trenton to Calgary, taking three "Siskins" with it. No. 3 (Bomber) Squadron was also transferred to Calgary. Prior to the move the Squadron made a long distance flight with four "Wapitis" from Ottawa to Halifax and return, completing the eastward flight in one day and the return trip in two. This demonstration of squadron mobility was repeated in October when the squadron, now eight aircraft strong, flew from Ottawa to its new base at Calgary, thereby making the first long distance transfer of an RCAF unit by air. No. 6 (Torpedo Bomber) Squadron was also transferred to Western Air Command, moving by rail from Trenton to Vancouver in November 1938. No. 2 (Army Co-Operation) Squadron at Ottawa carried out a movement exercise in September and October when it flew its "Atlases" to Halifax to engage in co-operation practice with the coastal battery at Halifax. After its return to Ottawa the squadron was transferred to Trenton and absorbed the personnel, equipment and functions of the School of Army Co-Operation.

The Non-Permanent Active Air Force was redesignated the Auxiliary Active Air Force on 1 December 1938 (21) and its strength, on paper, was increased to twelve squadrons by the authorization, effective 1 April 1938, of No. 114 (Bomber) at London, No. 116 (Coast Artillery CO-Operation) at Halifax, and No. 117 (Fighter) at Saint John, N.B. Although officers were appointed to command No. 114 (S/L J.M. Dobson) and No. 117 (S/L W.W. Rogers, MC) on 1 October 1938, the three new squadrons remained only as paper units until the eve of the war. With the expansion of this component of the Air Force

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(20) G.O. 151/38.

(21) AFGO 2/39.

three Wing Headquarters were authorized on 1 August 1938, No. 100 at Vancouver, No. 101 at Toronto, and No. 102 at Montreal. Two months later W/Cs A.D. Bell-Irving, MC, W.A. Curtis, DSC, and J.A. Sully, AFC, ADC, were appointed to command the wings.

Another addition to the Auxiliary was the organization of a Chaplain Service which was authorized on 1 December 1937. Clergymen selected for appointment to this service were to be granted honorary rank in the AAAF and placed on a special Chaplains List. The first RCAF Chaplain appointed was Bishop R.J. Renison who took up his duties as honorary flight lieutenant with No. 110 Squadron at Toronto on 1 July 1938. In February 1939 the Rev. F.K. Belton was named Chaplain for No. 111 Squadron at Vancouver. (22)

As a result of these various additions and moves the organization of the RCAF on 31 March 1939 was:

Permanent Active Air Force

RCAF Headquarters, Ottawa
RCAF Record Office, Ottawa
No. 1 Aircraft Depot, Ottawa
No. 2 Equipment Depot, Winnipeg
RCAF Station Headquarters, Ottawa
No. 7(G.P.) Squadron
No. 8 (G.P.) Squadron
RCAF Photographic Establishment
Test and Development Flight
Western Air Command Headquarters, Vancouver
RCAF Station Headquarters, Vancouver
No. 1 (F) Squadron, Calgary
No. 3 (B) Squadron, Calgary
No. 4 (G.R.) Squadron, Vancouver
No. 6 (T.B.) Squadron, Vancouver
No. 3 Repair Depot, Vancouver
Eastern Air Command Headquarters, Halifax
RCAF Station Headquarters, Dartmouth
No. 5 (G.R.) Squadron
No. 4 Repair Depot (authorized, but not formed)
Air Training Command Headquarters, Toronto
RCAF Station Headquarters, Trenton
No. 1 Technical Training School
Flying Training School
Air Armament School
Air Navigation and Seaplane School
Wireless School
Equipment Training School
No. 2 (A.C.) Squadron
RCAF Station Headquarters, Camp Borden
No. 2 Technical Training School

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(22) On the formation of the Chaplain Service see P.C. 1440 of 23 June 1938, and G.O.s 105, 107, 127, 137 and 143 of 1938, and A.F.O. 196/38.

No. 11 Technical Detachment, Montreal
No. 12 Technical Detachment, Toronto
No. 13 Technical Detachment, Vancouver
No. 21 (Magazine) Detachment, Kamloops
No. 9 (GR) Squadron)
) (authorized but not formed)
No. 10 (TB) Squadron)
Nos. 110 - 121 PF Detachments (23)

Auxiliary Active Air Force

No. 100 Wing Headquarters, Vancouver
No. 101 Wing Headquarters, Toronto
No. 102 Wing Headquarters, Montreal

No. 110 (City of Toronto) (AC) Squadron, Toronto
No. 111 (CAC) Squadron, Vancouver
No. 112 (AC) Squadron, Winnipeg
No. 113 (F) Squadron, Calgary
No. 114 (B) Squadron, London (authorized but not formed)
No. 115 (F) Squadron, Montreal
No. 116 (CAC) Squadron, Halifax (authorized but not formed)
No. 117 (F) Squadron, Saint John (authorized but not formed)
No. 118 (B) Squadron, Montreal
No. 119 (B) Squadron, Hamilton
No. 120 (B) Squadron, Regina
No. 121 (F) Squadron, Quebec (authorized but not formed)

By 31 March 1939 the strength of the Permanent Force had grown to 261 officers and 1930 airmen, an increase of 83 officers and 407 airmen during the year. (24) In the Auxiliary there were 99 officers and 867 airmen, an increase of 19 officers and 138 airmen. (25) The Reserve of Officers numbered 155.

The volume of applications for enrolment in the RAF and RCAF continued to grow as a result of the stimulus given by the deteriorating international situation and publicity about the expansion of the Canadian service. Once again the RAF took a larger share of the applicants than did the RCAF; 118 Canadians were selected for appointment to short service commissions under the "Direct Entry" scheme, and 15 more were selected for the "Trained in Canada" scheme. (26) In addition, two young Canadians were nominated for aircraft apprenticeships in the RAF.

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(23) These twelve detachments were authorized, effective 1 April 1938, for attachment to the Auxiliary squadrons (GO 65/38). Previously PF personnel attached to these squadrons had been included as an integral part of the squadron establishment and not constituted as a separate unit. Of the PF Detachments only eight were actually in existence, attached to Nos. 110, 111, 112, 113, 115, 118, 119 and 120 Squadrons.

(24) The new officers included 12 airmen commissioned from the ranks. Enlistments in the ranks totalled 486 and discharges 79.

(25) As usual there was a large turn-over in the ranks, 430 men being enlisted while 292 were released.

(26) Of these 15 candidates nine completed their training in October and then went overseas; another, whose training had been delayed by injuries received in a car accident, went over later in 1939.

RCAF Flying Time

The total flying by the RCAF, Permanent and Auxiliary, on all types of operations and training during 1938-39 was 27,069 hours, an increase of almost 7300 hours, or more than one-third, over the previous year. The most striking increase was in individual flying training which rose from 5,815 hours to 14,012.

Medical Services

The expansion of the RCAF and the organization of the three Air Commands involved an expansion also of the medical facilities provided by the RCAMC to a minimum requirement of 12 officers and 37 other ranks. The RCAMC continued to make medical examinations for candidates, 410 in number, for commissions in the RAF. There were five deaths in the RCAF during the year. One officer was killed in a flying accident, and four airmen lost their lives in other accidents or from natural causes.

C. Training

Of the 14,012 hours flown on individual flying training, almost 90% (12,474 hours) was done at Trenton. There was a great expansion in ab initio training of new pilots with 118 officers and 19 airmen under instruction during the year. In addition to the July 1937 intake which graduated 13 pilots in May 1938, and the January 1938 course which ended in October with 19 graduates (including nine for the RAF), three new intakes began training at Trenton in July and November 1938 and January 1939. The July course numbered 37 pilot officers (provisional), 29 of whom received their wings at Trenton a year later in June 1939, plus one carry-over from the January course; one other member of the July course completed his training at Camp Borden in August 1939, and four others transferred to the Non-Flying List. In the November 1938 intake there were 26 trainees. This course began training at Trenton and was then transferred to Camp Borden, in May 1939, for the final stage of the course. Seven pupils were retired during training. P/O (P) E.E. Devlin was killed in a flying accident on 24 July 1939 while practising formation flying on a Fleet. The other 18 members of the course received their wings at Camp Borden on 2 September 1939, just before the Second World War began, together with 10 officers from the January 1939 course. The latter course had started out at Trenton with 16 candidates for short service commissions in the RAF. In addition to the pilot officers trained during this period, twelve sergeant pilots received their wings in May 1938, three in June 1939, and three more in September 1939.

The new pilots graduated from the several courses were:

May 1938 - P/Os L.G.G.J. Archambault, L.J. Birchall, F.S. Carpenter, J.C. Fee, J.R. Frizzle, J.T. Gutray, H.R. McBurney, E.C. Sheffield, W.H. Stapley, R.B. Wylie, N.S.A. Anderson, A.B. Searle, and R.F. Douglas; Sgts. E.R. Austin, K. Birchall, C.E. Briese, J.J. Cotter, R. Dobson, G.O. Godson, R.R.B. Hoodspith, V.A. Margetts, R.F. Milne, A.W. Mitchell, R.H. Morris, and F.H. Pearce.

October 1938 - P/Os R.D.P. Blagrave, J.P.J. Desloges, T.G. Fraser, K.A. Gordon, J.B. Harvey, G.A. Hiltz, K.L.B. Hodson, A.N. Martin, E.M. Reyno, and J.A.D.B. Richer for the RCAF, and P/Os J.C. Campbell, R.M. Cox, A.A. Deacon, T.P. Harnett, W.B. Hodgson, D.M. Illsley, H.F. Marcou, H.P. Melanson, and C.A. Ross for the RAF.

June 1939 - P/O B.A. Power for the RAF, and P/Os F.W. Ball, A.P. Blackburn, R.A. Butts, J.A.J. Chevrier, E.W. Cowan, P.S. Delaney, R.R. Dennis, E.R. Johnston, W.C. Kent, A.G. Kenyon, A.Laut, M. Lipton, K.F. Macdonald, J.W.D. McKnight, G.E. McMurtrie, G.M. Martin, M.P. Martyn, S.R. Miller, L.H. Randall, W.A. Rider, C.G. Ruttan, G.W. Ryall, J.C. Scott, F.R. Sharp, R.O. Shaw, J.G. Stephenson, W.C. VanCamp, J.C. Wickett, and C.A. Willis; Sgts. S. Broadbent, B.G. Miller, and A.M. Sharp, and P/O G.J. Olstead (August 1939).

September 1939 - P/Os G.S. Austin, H.A. Beer, H.K. Corbett, R.L. Edwards, W.M. Foster, M.W. Gall, R.J. Gray,, H.L. Kay, J.H.U. LeBlanc, H.C. Ledoux, J.K.F. MacDonald, W.B.M. Millar, O.J. Peterson, R.N. Rand, J.B. Reynolds, J.G. Richardson, A.B.C. Weatherwax, J. Woolfenden, R.A. Ashman, B.E. Christmas, P.D. Iverson, J.W. Kerwin, G.T. Mitchell, E.W.J. Morris, L.B.B. Price, G.J.C. Reid, J.W. Reid, and W.M. Smith; Sgts. F. Pafford, R. Smither, and D.V. Thomas.

As indicated above, the flying training program was modified and Camp Borden, which had been used chiefly for technical training since June 1937, once again became a centre for flying training. In May 1939 a complete re-organization was made of the plan of training pilots for the service, and the organization of both Trenton and Camp Borden was changed to meet the requirements of the new scheme. Under this new scheme, based on the RAF standard syllabus for flying training schools (AP 1388), the pilot training course was divided into elementary, intermediate and advanced stages. Each of the three stages was approximately 16 weeks in duration; allowing one week between each stage for travelling from school to school, a pupil would complete the whole course in a year. At the conclusion of the three stages the pilot, in addition to individual training, would also have some experience in flight training.

The elementary training stage was to be given in eight civil flying schools at Halifax, Montreal, Toronto, Hamilton, Winnipeg, Regina, Calgary and Vancouver. The clubs would undertake three elementary courses each year, with a total of 32 pupils in each course. The intermediate stage was to be conducted at Camp Borden and the advanced course at Trenton. The aim of the new training scheme, which foreshadowed that adopted a year later under the BCATP, was to attain an annual output of about 125 fully trained pilots. Of these, 75 would be for the RCAF and 50 for the RAF; the RAF pilots would complete their elementary training in Britain before coming out to Canada for the intermediate and advanced stages in RCAF schools.

The new scheme was inaugurated in May 1939 when two courses which had started training at Trenton were transferred to Camp Borden for the final stages of instruction, and a month later 30 pilot officers (provisional) began their elementary training in the eight designated civil schools. Before they had completed the 16-weeks term war became imminent and at the end of August they were transferred to Camp Borden.

Through the 1938-39 fiscal year the courses of instruction at Trenton, Camp Borden and other stations followed the same general pattern as in previous years, with the noteworthy addition of courses on the Link trainer, for anti-gas defence, and for equipment officers. The Wireless School expanded its intake with 118 airmen under training as wireless operator mechanics, and the Equipment Training School had 57 apprentices under instruction as storekeepers. The two Technical Training Schools enrolled 227 airmen for trade training as fitters, carpenters, physical training instructors, motorboat crewmen, instrument makers, motor mechanics, coppersmiths, machinists, fabric workers and meteorologists.

Through the winter months courses were conducted as usual for the Militia to train Permanent and Non-Permanent Senior Officers and Air Liaison Officers, Training was also provided for RCMP personnel, including air engineers, as well as pilots; and, as in previous years, civilian flying instructors were given re-categorization tests.

Service training according to RAF syllabi was carried out by all the Permanent squadrons except No. 6, which did only flying training on its "Sharks", and Nos. 7 and 8, which were engaged on civil operations. No. 3 Squadron, thanks to its two long-distance flights to Halifax and Calgary, was particularly active, logging 1039 hours on its "Wapitis". In addition to 2838 hours on service training, units of the Permanent Force flew over 600 hours on co-operation exercises with the Army and Navy. No. 2 Squadron naturally did most of this work, sending out detachments of "Atlas" aircraft for exercises with Militia units at summer camp in eastern and western Canada. During a concentration of permanent force units of the Army at Camp Borden, from 8 August to 3 September, the last week of their training was devoted to a tactical scheme for the entire force, involving a mechanized move of 45 miles, an approach march, attack and occupation of a defended position. Aircraft from Nos. 2 and 3 Squadrons co-operated in all phases of the scheme and, in addition to reconnaissance, made simulated gas attacks on the troops.

Seven squadrons of the Auxiliary Active Air Force (Nos. 110, 111, 112,115, 118, 119, and 120) carried out preliminary flying training during the year (5646 hours), and also attended summer camp for 14 days of service training. The four eastern squadrons, Nos. 110, 115, 118 and 119, went to Camp Borden, No. 112 to Shilo, No. 120 to Dundurn and No. 111 to Sea Island. (27) The other Auxiliary squadrons had not yet become sufficiently organized to begin flying training, but No. 113 (Calgary) had recruited personnel and commenced ground training. The first fatality in the AAAF occurred on 2 June 1938 when P/O P.F. Birks of No. 115 Squadron was killed in a flying accident at Ivy, Ont., while his unit was attending summer camp at Camp Borden.

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(27) In December 1938 the direction of service training for the Auxiliary was transferred from the Air Staff to the Air Personnel Staff Division at Headquarters.

Training outside RCAF facilities was still expanding. Twelve officers and seven airmen were taking various courses in the United Kingdom and nine more airmen were receiving instruction in Canada and the United States. G/C A.E. Godfrey went overseas to Imperial Defence College early in 1939. His course there was interrupted by the outbreak of war, as was the course at RAF Staff College where S/L R.E. McBurney and F/L C.B. Turner were in attendance. In the previous staff course which terminated late in 1938 S/Ls C.R. Slemon and M. Costello qualified for "p.s.a." F/Ls C.L. Trecarten and J.L. Hurley were at the School of Aeronautical Engineering at Henlow for automatic control and specialist "E" courses, F/L R.C. Procter was at the Air Armament School at Manby, and F/L D.M. Edwards at the Central Flying School at Upavon. F/O W.M. Murray qualified in the explosives course at Altrincham. F/L F.R. Miller was taking a specialist course in navigation at Manston, and F/L D.G. Williams a signals course at Cranwell. Cpl. H.N. Hinton qualified in the drill and physical training instructors course at Uxbridge and was followed by Cpl. L.W. Hook. Five more airmen, Cpl. J.C. Holton, LAC J.S.L. Cates and AC 1s T.A. Seeman, W. Harle and O.G. Dendy, were sent to the Electrical and Wireless School at Cranwell for training as instrument makers and repairers. At home, an airman was under instruction at the Dominion Meteorology Service in Toronto, seven more were being trained by the Ford Motor Company at Toronto and Ottawa, and another was taking a camera mechanics course with the Fairchild Aircraft Company at Jamaica, L.I.

Early in 1939 F/Ls W.I. Clements, F.M. Gobeil and J.H. Ferguson went overseas on exchange to the RAF, and S/L A.J. Kennedy and F/Ls W. Macey and C.F. Herington came out to Canada. S/L F.V. Heakes was now the RCAF Liaison Officer at the Air Ministry.

"Air Cadets"

An interesting development in 1938 was a precursor of the Air Cadet Corps which played such an active part during and after the Second World War. Several Cadet Corps maintained by the Army became interested in aviation and applied to Militia Headquarters for permission to affiliate with local RCAF units. The first to do so was No. 162, The Ridley College Cadet Corps at St. Catharines, which in May 1938 was granted authority to become affiliated with No. 119 Squadron of the Auxiliary Active Air Force at Hamilton. Subsequently No. 303, Trenton High School Cadet Corps, became affiliated with RCAF Station Trenton (October 1938), and No. 1601, Air Force Cadet Corps at Vancouver, became affiliated with No. 111 Squadron of the Auxiliary in that city. (28) Lectures in aeronautical subjects were arranged for the cadets of these three corps.

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(28) See AFO 225/38 and AFROs 29 and 160 of 1939.

D. Operations

There was a slight decrease in operational flying during the year with a total of 3907 hours for 1938-39 as compared with 4022 for 1937-38. The major civil government operation was aerial photography for the Interdepartmental Committee on Air Surveys and Base Maps, with a smaller amount for the Geographical Section of the General Staff, which accounted for 1774 1/2 hours of the CGAO flying. Transportation flying totalled 1089 hours, test and development 1024, and some work for the Militia took 19 hours.

In the 1938 season a new type of film was introduced which almost doubled the time available for photography. In the Great Slave and Athabaska lakes areas, for example, the film could be used as early as 0500 hours during June and 0600 hours during July and early August. No. 8 (GP) Squadron at Rockcliffe, now under the command of F/L W.W. Brown, did most of the photographic work (1635 hours). Four detachments were in the field. No. 6 Detachment with two of the new Northrop "Deltas" (F/S R.I. Thomas and Sgt. P.E. Sorenson) flew out to Vancouver at the end of March to spend six months working along the British Columbia coast. Nos. 2 and 3 Detachments with four "Deltas" (F/Os S.S. Blanchard, R.C. Davis and H.H.C. Rutledge and Sgt. R. Gilmour) left early in May for Winnipeg for operations over the prairies on wheels until ice conditions permitted a change to floats for work in the Northwest Territories. On of the new Noorduyn "Norseman" aircraft accompanied these detachments when they were in the NWT for transport support. No. 7 Detachment with two Bellancas (F/Os J.E. Doan and F.J. Ewart) was engaged chiefly in Quebec (Blue Sea Lake, Bark Lake and Grand'Mere), after some early operations in Nova Scotia to complete a high priority task around Truro. In addition to the operations by the detachments of No. 8 Squadron, No. 5 at Dartmouth also did some photographic work (133 hours), and Trenton and Vancouver contributed a few hours. Assignments were completed in the Northwest Territories and all the provinces except Manitoba, the largest single project being once again the drought area in the prairies. Thanks to the use of the faster film and the more modern "Delta" aircraft, the photo detachments were able to do more work in less time and they all returned to Ottawa by 1 October, two months earlier than usual. For the Interdepartmental Committee they photographed 80,000 square miles on 529 rolls of film, an increase of 12,150 square miles and 171 rolls over the previous year; for the GSGS the figures were 6,250 square miles on 62 rolls of film, somewhat less than the 1937 totals.

Transportation flying, done chiefly by the two squadrons based at Ottawa, decreased slightly to 1089 hours. There was little flying for Militia Service requirements (19 hours), but there was a great increase in test and development work which rose from 605 hours in 1937-38 to 1024 hours in 1938-39; Trenton and Ottawa largely monopolized this type of work.

E. Equipment and Development

Photography

As replacement for the large and heavy cameras currently in use for air survey work, the National Research Council was engaged in production of a smaller model which would take a photograph four inches square in size; it was expected that the new camera would be ready for tests in 1939. A Ross camera using a special wide-angle lens was given preliminary trials during the 1938 season. A photographic trailer was also designed and constructed for use in the field and, after tests proved it to be satisfactory, several specimens were ordered to equip some of the squadrons in 1939.

Signals

Progress was made in the development of the signals service, both in the training of personnel and the introduction of equipment. The Wireless School at Trenton trained about 60 operators. More aircraft were equipped with service radio, in pursuance of the policy to fit all aircraft with sets, and, to obtain equipment more suitable for the Canadian climate and service conditions, it was decided to develop and purchase Canadian-designed and built radios. The photographic detachments of No. 8 Squadron used radio successfully during their operations in the northwest. Construction of a high frequency Adcock direction finding station was begun at Trenton.

Armament

Thanks to the increased facilities provided by the new Air Armament School buildings at Trenton, which were completed and occupied during the year, more complete syllabi of armament instruction could be introduced with resultant improvement in the standard of training of armament artificers and instructors. The new air firing and bombing range near Trenton was also brought into use with excellent training facilities for live and practice bombing, air-to-ground firing, and air-to-air-firing. The latter type of training, using towed targets, was carried out for the first time in the RCAF in the autumn of 1938. A site was selected for another firing and bombing range near Dartmouth which it was hoped would be ready in the summer of 1939. The explosive storage centre at Kamloops was completed during the year, and another magazine was under construction in eastern Canada at Debert.

Deliveries were completed of the stocks of .303 ammunition links and 11½ lb. practice bombs which had been ordered from Canadian manufacturers. The successful fulfilment of these contracts meant that the RCAF was no longer dependent on RAF sources for such supplies, and in pursuance of the same policy continued efforts were made to explore the possibility of manufacturing other armament stores in Canada.

Miscellaneous Equipment and Facilities

A scow seaplane tender which embodied a radio station, fuel supply, workshop, slipway and meteorological station had been produced and used with considerable success for survey operations along the west coast. Another improved type was being developed.

To provide meteorological information necessary for air operations on the west coast arrangements were initiated with the Department of Transport to establish a meteorological station at Jericho Beach with an extension of the teletype line from the existing station at Sea Island. In this way information from the whole chain of weather stations across Canada would be immediately available to Western Air Command.

The Link trainer was introduced into the service in 1937 when one model was purchased and installed at Trenton. In the spring of 1938 three more models were received and sent to Ottawa, Dartmouth and Vancouver. Installation took some little time and as a result, coupled with some doubts about the utility of the trainer, only limited use was made of the Link before the outbreak of war. F/L F.R. Miller, the first RCAF officer to receive instruction on the Link, trained some pupils on the machine at Trenton late in 1937. The first formal course was given at Ottawa by F/L J.G. Bryans in November 1938 to a class consisting of F/L H.H.C. Rutledge, F/O F.E.R. Briggs, F/O R.M. McKay and P/S F.J. Ewart; the course covered only two weeks, 21 November to 3 December.

To meet the increased demands for supervision of work done by contractors for the RCAF it was necessary to augment the staffs of the three Technical Detachments at Montreal, Toronto and Vancouver.

Research

At the request of the Department of National Defence the National Research Council conducted experiments to determine the value of various coloured goggles in piercing haze and increasing visibility. Pilots who wore the goggles reported that, although they did improve the visibility, they caused eyestrain. The principal medical officer at WAC was investigating this problem.

Other research projects initiated or continued in close collaboration with the NRC included aerodynamic research on ski gear, aero engine testing, X-ray examination of light alloy castings, detection of metal airscrew fatigue, analysis of aircraft vibration, design of aircraft fire walls, and study of the cathode ray direction finder.

Survey of Industry

By 31 March 1939 the survey being made by the Navy, Army and Air Supply Committee had covered 1377 firms. Existing facilities had been recorded for many of the companies, and an estimate made of the plant capacity to produce material or supplies likely to be required in an emergency. Through the collaboration of engineering, chemical and mining institutes, a voluntary registration of professional men was being prepared.

F. Construction

Further progress was made in the selection of advanced bases, anchorages and other sites and in the development of permanent and advanced bases already selected. In Western Air Command some additional property was acquired for Jericho Beach (Vancouver) and the station was improved by the construction of two seaplane hangars and an apron; a barrack block was also erected and a building purchased for single officers quarters. A 650-acre site at Patricia Bay was being developed as an airfield and it was expected that it would be ready to receive its first unit in the fall of 1939. At Alliford Bay, where 160 acres had been secured, construction of quarters, slipway and apron had been started. Detailed plans were prepared for a site tentatively chosen for a seaplane base at Seal Cove near Prince Rupert where, in earlier years, fishery patrols had been carried out. The construction of four magazine buildings and caretaker's quarters for the explosives depot at Kamloops was completed, some development was done at Calgary, and tentative sites had been selected for several wireless direction-finding stations on the Pacific coast.

In Eastern Air Command Dartmouth had been extended and improved, and a men's barrack block had been erected. Sites were acquired for aerodromes at Yarmouth, Truro (843 acres), and Sydney (192 acres), and development began. Advanced operational sites had been tentatively selected at the Magdalen Islands, the Bay of Chaleur, and Anticosti Island.

Much additional work had been done on the development of Trenton, including construction of mess buildings for NCOs and airmen, a central heating plant, hospital building, radio station, engine test house, stores building, underground telephone system, and a slipway, as well as grading and dredging on the airfield and seaplane base. At Rockcliffe improvements included additional accommodation for single officers and married airmen. A new wing was added to the stores building of No. 1 Depot on Victoria Island at Ottawa; and the runways on the aerodrome at Petawawa were extended.

For the Auxiliary Active Air Force premises were purchased for a city headquarters for No. 110 Squadron at Toronto and No. 113 at Calgary; construction of a hangar was started at St. Hubert for No. 118 Squadron.

The total expenditure on construction from RCAF funds was $1,683,795.51, of which $702,386.15 was for work on the east coast, $518,452.02 for the west coast, and $240,732.17 for Trenton.

Chapter XXIII

The Last Months of Peace (1939)

A. Parliament

The fourth session of the 18th Parliament opened at Ottawa on 21 January 1939 in the brief breathing-space between the Munich agreement in September 1938, which failed to bring "peace for our time", and the Nazi attack upon Poland eleven months later. The uneasy state of international relations was reflected in the Governor General's speech at the opening of Parliament in which he said:

> "... the uncertainties of the future, and the conditions of modern warfare, make it imperative that Canada's defences be materially strengthened. Two years ago, the appropriations for defence were substantially increased, and a beginning was made on a program of modernization to safeguard the country from the dangers of attack. The government intend to pursue this policy vigorously, and to propose to parliament that the program of defence should be further augmented, and that particular emphasis should be laid upon air defence."(1)

Members expressed their great concern over the problem of defence in a long debate on the international situation(2) and in various questions directed to the ministers. One member drew attention to an article in the Canadian Defence Quarterly which mentioned the possibility of air attacks upon Canada from bases in Hudson Bay(3), and another asked about reports of German negotiations for seaplane bases in Iceland. Mr. Mackenzie replied that although he had not seen the reports he could assure the member that "very aggressive steps will be taken during this present year for the development of airports on the Atlantic coast."(4)

In the type draft of the RCAF submission for the 1938-9 departmental Annual Report a section on "Aircraft Situation" was included under the heading "Air Staff - Plans and Service Operations". This section was omitted from the published report. The section reads:

Aircraft Situation - The aircraft situation at the 31st March, 1939, was as follows:-

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(1) Hansard, 1939 Session; Vol. I, p. 3.
(2) Ibid.; Vol. III, pp. 2409-2582 (debates of 30 and 31 March and 3 and 4 April 1939).
(3) Ibid.; Vol. I, pp. 861-62; the article was written by F/L A. Carter, MM.
(4) Ibid.; Vol. II, p. 2147. Another member referred to an article in a Winnipeg newspaper alleging that the Advisory Air Council consisting of A/M Bishop, A/C Mulock, S/L Bell-Irving, S/L McGill and Capt. Burden, had complained about the unsatisfactory state of the air defences, and demanding that the minister should resign. Prime Minister King read telegrams from all five members of the council denying the truth of the newspaper report, and concluded: "This record speaks for itself". Ibid.; Vol. II, pp. 1961-63.

	Service Types	Advanced Primary Types	Primary Training Types	Transport	Total
On Hand	68(a)	16	94	32	210
On order	116(b)	50			166
Total:	184	66	94	32	376

Notes: (a) Includes 14 Modern, 22 Obsolescent, 20 Obsolete and 12 Civil Aircraft now being converted to Service use.

(b) Includes 108 Modern Service, and 8 Civil aircraft now being converted to Service use.

This situation is an improvement over that at 31st March, 1938. Now that the Canadian aircraft industry is becoming established, quicker delivery can be anticipated.

Under "General Progress" the draft submission also stated: "The tension in international relations during the year made it necessary to hasten the fulfilment of defence plans; and considerable progress was made....."

Under "Equipment and Development Staff - Directorate of Air Equipment - (i) Procurement Branch - Provision of Equipment" a section was also omitted:

60 new aircraft of service and training types and 62 aircraft engines for them were ordered
1 38-foot motorboat was delivered from contractor in Canada
2 flying boats, 9 General Purpose aircraft and 16 training aircraft were manufactured by contractors in Canada, and delivered
12 service type aircraft were imported from England, and 1 transport aircraft was supplied through Canadian agents.

When the national defence estimates were presented on 26 April Mr. Mackenzie introduced them with a detailed statement of government policy in which, after carefully analysing the basic factors in defence, he said:

> "For these purposes which I have specified, the conclusion has been reached - although in regard to that conclusion there are differences of opinion - that the first line of defence for the Dominion of Canada must be the air force...."

When he took office in 1935, the minister said, it was considered that the greatest risk to Canada was on the Pacific coast, and in preparing the defences the priorities established had been, first, the fortification of the Pacific coast prior to the Atlantic, second, the development of the air force in priority to the navy, and so far as possible the navy in priority to the militia, and third, the reorganization and re-equipment of the militia as soon as resources would permit. He then described in detail the progress that had been made in "repairing the deficiencies" in the air service since 1935 when it was virtually unarmed with only 23 obsolescent

service type aircraft, no bombs available for use, and no Canadian aero engine industry. In the three years 1936-37 to 1938-39 more than $27,000,000 had been spent on the air service, its strength had been more than doubled, its administration decentralized in three air commands for the sake of efficiency, and a great program of construction undertaken to develop air bases on the two coasts. In that period 201 aircraft and 263 engines had been ordered and, up to 31 March 1939, deliveries had been received of 110 aircraft and 233 engines. With these additions the RCAF had a total of 210 aircraft on hand, of which 36 were modern service types, and when the aircraft still on order had been delivered (by May 1940, it was anticipated), the strength would be 250, of which 112 would be first-line service types and 138 training or survey types.

Turning then to the program proposed for 1939-40, Mr. Mackenzie said that a grant total of $60,000,000 was asked for national defence, of which the air service's share would be almost one-half, $29,775,565, an increase of $18,089,048 (or more than 150%) over the previous year. The air estimates were subdivided into $20,085,238 for the Permanent Force, $3,365,277 for the Auxiliary, $6,000,000 for the training of pilots for the RCAF and RAF, and $325,050 for Civil Government Air Operations.

The planned objective, the minister said, was to build up a force of 525 officers and 4,500 airmen in the Permanent and 220 officers and 2,014 airmen in the Auxiliary,(5) with a total of 527 aircraft, of which 312 would be for active operations in squadrons and 215 for training and reserve. For the present year the establishment of the PAAF was to be raised to 273 officers and 2,172 airmen, or approximately one-half the target strength, representing an increase over current strength of 14 officers and 217 airmen.

With respect to aircraft, orders placed in previous years, less actual and estimated wastage, had provided for 250 machines by the spring of 1940; in the current year orders would be placed for an additional 107 aircraft and about 50 spare engines. The PAAF was to receive 88 aircraft, at a cost of $4,471,003, consisting of 26 fighters, 18 twin-engined bombers, 12 twin-engined and 10 single-engined general purpose, 10 twin-engined general reconnaissance, 6 flying-boats, and 6 army co-operation machines. For the Auxiliary 19 aircraft were to be purchased at a cost of $1,173,646; 15 of these were to be observation aircraft and the other 4 advanced trainers. The 18 twin-engined bombers and 14 of the fighters were to be purchased abroad for delivery during the fiscal year;(6) the other 75 aircraft were to be manufactured in Canada and delivery of them would not be completed within the year.

Referring to the decision to order most of the aircraft from Canadian manufacturers rather than to obtain them more quickly by purchase abroad, Mr. Mackenzie said:

> "This delay was considered well worth while, because the development in Canada of a future source of supply for service aircraft is in itself a major contribution to

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(5) Of the total 745 officers, 599 would be pilots and 146 ground duties personnel; a small proportion of the airmen would also be pilots.

(6) Later, in the debate on the air items in the estimates, Mr. Mackenzie referred to the necessity, because of the immediate urgency, of ordering aircraft from United Kingdom and United States sources, rather than from Canadian manufacturers.

national defence. Until this department went into the market and sought to develop this domestic source of supply, the manufacture of modern service aircraft was an industry that did not exist in Canada. Whatever benefits may accrue to Canadian industry from the recent decision of the British air ministry to purchase aircraft in Canada are attributable to the policy of the Department of National Defence in fostering this Canadian industry, because the air ministry decided to deal only with firms which were already engaged in production. On the other hand, the decision of the British government to place orders in Canada will have several benefits to the Department of National Defence. On the strength of British orders additional plants and equipment will be brought into use; additional engineers and workers will be trained in the production of service craft and, due to the larger operations, the unit cost to the Canadian government of similar orders will be substantially reduced".

The construction program, on which $4,023,000 would be spent, proposed development of the air defences on the two coasts, at Vancouver, Patricia Bay, Alliford Bay and Prince Rupert, Dartmouth, Yarmouth, Sydney and Truro, the further improvement of Trenton and Rockcliffe, and the erection of a central repair depot, four direction-finding and one wireless telegraph stations at sites not yet finally determined.

The item of $6,000,000 for the training of pilots was explained at great length. Referring to the discussion in the previous session about co-operation with the British in the joint training of pilots, Mr. Mackenzie said that the program arranged under this appropriation was to train 76 pilots for the RCAF and 50 for the RAF in a three-stage syllabus of elementary, intermediate and advanced flying.(7) The sum included pay and allowances for pupils, instructors and ground staff, plus equipment and buildings required for the scheme. The latter items would initially be large, involving $2,123,160 for new aircraft and engines, $56,500 for aircraft spares, $932,000 for new works and buildings, and $116,500 for barrack equipment, making a total of $3,228,160. Ninety-three new training aircraft would be purchased, representing 71 for active use and 22 for reserve. The elementary stage in the one-year course would be done at civilian flying schools; for the intermediate and advanced stages the instructional and maintenance staff required would be about 68 officers and 600 airmen, and it would be necessary to increase the air force by that number during the coming year. Key positions in the training scheme would be filled as far as possible from existing complement; the remainder would be enrolled from the Auxiliary or civil sources.(8) Pay and allowances for the first year's operations would be slightly more than $1,000,000, and

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(7) This training for the RAF was in addition to the existing methods by which Canadian candidates could enter that service, i.e., two Canadians selected and trained each year in Canada for permanent commissions, 15 trained each year in Canada for short service commissions, and 120 applicants for short service commissions interviewed, medically examined and selected in Canada.
(8) It was anticipated that "a limited number of high grade instructors" from the RAF would be attached to the RCAF instruction staff "under the jurisdiction of the department here".

maintenance (including fuel, overhaul, spares, clothing, miscellaneous stores, etc.) would run to $1,319,000 for the year.

Referring to the prime minister's statement the previous year that Canada was prepared to give facilities in her own establishments for the training of British pilots, Mr. Mackenzie said that discussions had been proceeding on the basis of those statements and added:

> "....while the final detailed technical arrangements have still to be completed, it is possible to say now that agreement has been reached on a scheme whereby pilots from the United Kingdom will come to Canada to be given the intermediate and advanced stages of training under the auspices of the Canadian Department of National Defence.....One of the main reasons for sending men to train to Canada is that Canadian topographical and climatic conditions give opportunities for specialized training. The duration of the scheme will be three years. It is contemplated that the number of pilots coming from the United Kingdom for training will not exceed fifty in any one year. It is planned that, after twelve months' experience of the working of the scheme, the actual costs involved should be investigated by representatives of the Department of National Defence and the air ministry jointly and that, if needs be, the basis of payment should be revised after such investigation."

Two innovations were embodied in the new pilot training program, i.e. the introduction of short service commissions into the RCAF, and the use of civilian flying clubs for the elementary training stage. Hitherto candidates for commissions in the Permanent Force had been required to be graduates of either RMC or a Canadian university. This high standard had been based "on the assumption that the permanent air force officers must all be competent to assume the most exacting technical and administrative duties of what is, in a sense, a very large engineering organization." But the rapid expansion of the past three years had created two problems: the "extreme physical strain of active flying" necessitated some turnover among junior officers to avoid the "tendency for the force to become grounded through lack of physical fitness", and secondly if all officers held permanent commissions there would not be enough administrative posts for those who attained seniority. It had accordingly been decided to introduce short service commissions, similar to those granted in the RAF, with the ultimate aim of having half the officers on permanent and half on short service commissions. The period of service for the new type of commission would be four years on the active list followed by six on the reserve. The ordinary requirements of nationality and physical fitness would remain unchanged, but the educational standard would be lowered to the equivalent of junior matriculation plus three or more senior matriculation subjects. Candidates would be considered under three categories: (1) applicants without previous flying experience who were unmarried and between 18 and 25 years of age; (2) qualified pilots from the Auxiliary and the Reserve; and (3) commercial pilots.

Provision was made for the award of a limited number of permanent commissions to those accepted for short service and a further limited number of SSC officers could continue on "medium service" commissions for an additional five years (i.e. a total of nine). Pay would be the same as for general list officers, except that

provisional pilot officers would receive $3.50 a day, plus 50 cents in lieu of rations and quarters, while in training at civilian schools. At the end of their four years the SSC officers would be assisted in reestablishment in civil life. Upon transfer to the reserve each officer would receive a gratuity of $500 for each of the last three years of service, and in addition 5% of his pay, which had been deducted as deferred pay, would be returned to him. Thus at the end of the normal four-year term an SSC officer would receive a cash gratuity of $1,500 plus 5% of all pay earned.

Paying tribute to the "important role" which civilian flying clubs had played in the development of aviation in Canada, Mr. Mackenzie said that it was now proposed "to assign them a definite role in the training of pilots for the Royal Canadian Air Force." Each club approved for the elementary training stage would provide one aircraft and would receive two from the department. The club would also provide two instructors, holding the standard certificate, and would contract to carry out the training according to the syllabus laid down by the department. To ensure equality of instructional standards throughout the clubs, all instructors would at the outset be given a refresher course at Camp Borden. Separate contracts would be arranged between the department and each club according to a form worked out with the flying clubs association, the rates of compensation and other terms being based on "the existing experience of the clubs, checked against departmental information." In addition to payment on the basis of each flying hour, the club would receive $200 for each officer whose training was completed to the satisfaction of the department; a scale of compensation for lectures and ground instruction was also provided. It was estimated that the flying club would receive a total of $840 from the department for each pilot trained. The minister commented that "the clubs are endeavouring to render this vital service to our aerial defence without profit to their organizations."

After this detailed exposition of the air service estimates, Mr. Mackenzie turned to "more general conclusions with regard to the philosophy of defence." The tasks of the air force he summarized as:

1. Air action in defence of points of national importance from air attack in conjunction with ground anti-aircraft defences and observer corps;

2. In co-operation with the sea forces to reconnoitre coastal regions, focal sea areas and vicinities;

3. Operating alone or in co-operation with the sea and/or land forces to destroy hostile surface craft or aircraft or land force raiders;

4. Air observation for coast defence artillery.

"With regard to these tasks the air force has a tremendous advantage over the other two services. The inevitable growth of civil aviation in a natural flying country such as Canada has provided and will continue in greater degree to provide a reserve of experienced pilots. The accompanying growth of the aircraft industry and its recent expansion into the production of service type aircraft will complete the twin essential bases of an effective military air force, namely, a reserve of experienced pilots, and the means of producing major types of equipment and armament

within our own borders."

In the air force the objective was to build up 11 permanent squadrons and 12 non-permanent. These 23 squadrons would be grouped into three commands,(9) with eight squadrons and one flight in Western Air Command and nine squadrons in Eastern, all of which were "allotted to duties of direct defence." The remaining six squadrons in Central Air Command(10) would be available "for use as a reserve in accordance with exigencies that might arise."(11)

In the debate that followed the minister's detailed exposition of the government's defence policy, Mr. R.J. Manion, leader of the opposition, spoke on the theme "we are not properly prepared in any way to defend ourselves should there be a world war." He said that the training of 50 British pilots was "merely a fleabite" and urged co-operation with the British government "to the utmost possible degree..."(12) Mr. A.G. Slaght also urged that even more money be appropriated for the air service, but Mr. C.G. MacNeil once again expressed his view that the importance of the air force was overemphasized.(13)

When the air estimates came up for consideration there was relatively little discussion; the general debate on defence policy had covered the ground thoroughly.(14) Parliament prorogued on 3 June 1939. Three months later the United Kingdom declared war on the Third Reich and one week later the Dominion of Canada followed suit.

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(9) Although the minister referred to "the existing 23 squadrons", he was obviously referring to the planned, not the actual, situation.
(10) Central Air Command was not authorized until 1 August 1939; it was to embrace a headquarters and such units as were allocated, with localization to be promulgated later. A.F.G.O. 39/39. Because of the outbreak of war its organization was not proceeded with.
(11) Hansard, 1939 Session; Vol. III, pp. 3233-68.
(12) Ibid.; Vol. IV, pp. 3969-84.
(13) Ibid.; Vol. IV, pp. 3991-4008, 4013-51.
(14) Ibid.; Vol. IV, pp. 4154-56, 4271, 4290-99.

B. RCAF Organization and Strength

In the last few months of peace in 1939 the organization of the RCAF was further revised and expanded. At Air Force Headquarters the Air Staff Division was divided into five Directorates for Plans and Operations, Air Organization, Air Signals, Armament and Air Staff Duties.(15) In the field three new units were authorized for Eastern Air Command - No. 22 (Magazine) Detachment at Debert, near Truro, N.S., No. 4 Repair Depot at Dartmouth, and No. 5 Equipment Depot at Moncton.(16) At RCAF Station Ottawa a Communication Flight was authorized.(17) It was also proposed to form a Central Air Command, effective 1 August 1939, but the outbreak of war a month later deferred its organization.(18)

The introduction of the new tri-stage training scheme in May 1939 resulted in a division of the Flying Training School into two wings. The Intermediate Training Wing Headquarters was set up at Camp Borden with an Intermediate Training Squadron and Intermediate Ground Instructional School. At Trenton there were the Advanced Training Wing Headquarters, Advanced Training Squadron, and Advanced Ground Instructional School.(19)

The objective of 23 squadrons - 11 Permanent and 12 Auxiliary - was attained when No. 11 (General Reconnaissance) Squadron was authorized on 1 August 1939.(20) Three of the Permanent squadrons and four of the Auxiliary squadrons, however, existed as yet only on paper, so that the effective strength of the RCAF at the end of August 1939 was 16 squadrons, eight in the PAAF and eight in the AAAF.

The organization of the Force on the eve of mobilization was:
R.C.A.F. Headquarters, Ottawa
Western Air Command Headquarters, Vancouver
Air Training Command Headquarters, Toronto
Eastern Air Command Headquarters, Halifax

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(15) Air Organization, previously a branch of the Directorate of Air Operations, Plans and Organization, was made a separate Directorate on 1 April 1939. The Directorate of Plans and Operations now comprised branches for Plans and Service Operations, Service Training, Civil Government Air Operations, Photography, and Intelligence - a newcomer to the AFHQ fold.

(16) No. 22 (M.) Detachment was authorized on 1 April 1939 (AFGO 7/38). No. 4 Repair Depot, authorized 1 April 1938 (G.O. 48/38), was not localized until 1939, and did not actually form before the war began. No. 5 Equipment Depot, authorized 1 August 1939 (AFGO 37/39), was originally scheduled for Truro, but was relocated at Moncton a month later (A.F.G.O. 57/39); it did not form before the war.

(17) Effective 1 August 1939 (A.F.G.O. 36/39).

(18) A.F.G.O. 39/39.

(19) With the resurrection of Camp Borden as a centre for flying training as well as technical training, W/C L.F. Stevenson succeeded W/C R. Collis in command of the station on 1 May 1939. S/L D.A. Harding was in charge of the Intermediate Training Squadron at Camp Borden, and S/L W.I. Riddell the Advanced Training Squadron at Trenton.

(20) A.F.G.O. 38/39; redesignated a Bomber Reconnaissance unit on 1 September 1939 by A.F.G.O. 57/39.

R.C.A.F. Station Headquarters, Vancouver
R.C.A.F. Station Headquarters, Camp Borden
Intermediate Training Wing Headquarters
Intermediate Training Squadron
Intermediate Ground Instructional School
No. 2 Technical Training School
R.C.A.F. Station Headquarters, Trenton
Advanced Training Wing Headquarters
Advanced Training Squadron
Advanced Ground Instructional School
No. 1 Technical Training School
Air Armament School
Equipment Training School
Air Navigation and Seaplane School
Wireless School
R.C.A.F. Station Headquarters, Ottawa
Photographic Establishment
Test and Development Flight
Communication Flight
R.C.A.F. Station Headquarters, Dartmouth
R.C.A.F. Record Office, Ottawa
No. 1 Aircraft Depot, Ottawa
No. 2 Equipment Depot, Winnipeg
No. 3 Repair Depot, Vancouver
No. 4 Repair Depot, Dartmouth (authorized, not formed)
No. 5 Equipment Depot, Moncton (authorized, not formed)
No. 1 (Fighter) Squadron (Calgary)
No. 2 (Army Co-Operation) Squadron (Trenton)
No. 3 (Bomber) Squadron (Calgary)
No. 4 (General Reconnaissance) Squadron (Vancouver)
No. 5 (General Reconnaissance) Squadron (Dartmouth)
No. 6 (Torpedo Bomber) Squadron (Vancouver)
No. 7 (General Purpose) Squadron (Ottawa)
No. 8 (General Purpose) Squadron (Ottawa)
No. 9 (General Reconnaissance) Squadron (authorized, not formed)
No. 10 (Bomber) Squadron (authorized, not formed)
No. 11 (General Reconnaissance) Squadron (authorized, not formed)
No. 11 (Technical) Detachment, Montreal
No. 12 (Technical) Detachment, Toronto
No. 13 (Technical) Detachment, Vancouver
No. 21 (Magazine) Detachment, Kamloops
No. 22 (Magazine) Detachment, Debert
Nos. 110-121 P. F. Detachments (attached to Auxiliary squadrons)

Auxiliary Active Air Force

No. 100 Wing Headquarters, Vancouver
No. 101 Wing Headquarters, Toronto
No. 102 Wing Headquarters, Montreal
No. 110 (Army Co-Operation) Squadron, Toronto
No. 111 (Coast Artillery Co-Operation) Squadron, Vancouver
No. 112 (Army Co-Operation) Squadron, Winnipeg
No. 113 (Fighter) Squadron, Calgary
No. 114 (Bomber) Squadron, London (authorized, not organized)
No. 115 (Fighter) Squadron, Montreal
No. 116 (Fighter) Squadron, Halifax (authorized, not organized)
No. 117 (Coast Artillery Co-Operation) Squadron, Saint John (authorized, not organized)
No. 118 (Bomber) Squadron, Montreal
No. 119 (Bomber) Squadron, Hamilton
No. 120 (Bomber) Squadron, Regina
No. 121 (Fighter) Squadron, Quebec (authorized, not organized)

The peace establishments authorized for the RCAF on the eve of mobilization showed 635 officers and 5,550 airmen in the Permanent and 220 officers and 2,014 airmen in the Auxiliary.(21) The limited establishments approved for the two components allowed only about 60% of these figures - 340 officers and 3,065 airmen in the PAAF, and 189 officers and 1,246 airmen in the AAAF.(22) The actual strength at 31 August 1939 was well below the authorized establishments although both the Permanent and the Auxiliary had expanded considerably in the five months since the start of the fiscal year. In the PAAF there were 298 officers and 2,750 airmen (total 3,048),(23) with 112 officers and 901 airmen (total 1,013) in the AAAF. There was thus in these two components, excluding the Reserve of Officers, a total of 4,061 who could be placed on active service.

Aircraft

In the last few months of peace the RCAF was busy accepting new types of aircraft to modernize its equipment. Only a few of these, however, had been issued to the Squadrons before the force was mobilized for war.

At the end of August 1938 No. 1 (Fighter) Squadron, under the command of S/L E.G. Fullerton, moved by rail from Trenton to Calgary, taking with it three of the six "Siskins" which still remained in service; later two more of the veteran and long obsolete fighters were sent out to Calgary. The squadron continued flying its "Siskins" until 3 June 1939 when the five were finally sent to High River for storage. Meanwhile, on 16 February 1939, S/L Fullerton and a party of airmen had gone to Sea Island airport at Vancouver to uncrate and assemble the first ten Hawker "Hurricane" fighters which the RCAF had purchased from the United Kingdom. As each aircraft was assembled S/L Fullerton air-tested it and gave his pilots what instruction was possible on the ground.

The first of the "Hurricanes" was written off a few days later in an accident that had particular interest for the RCAF. On 2 March a sergeant pilot, making his first flight on the new monoplane fighter, swerved off course on the take-off run and headed toward a Ford tri-motor which was parked on the airfield. At the last moment the "Hurricane" pilot, noticing the other aircraft in his path, tried to pull the fighter into the air, but struck a wing of the Ford and cartwheeled to the ground. The "Hurricane" was destroyed and the Ford was badly damaged; but the sergeant pilot fortunately escaped injury. The Ford tri-motor was the venerable "WZ" which the RCAF had purchased in 1929 for dusting work and sold in 1937 for a mere fraction of its original cost. The new owner claimed compensation for the loss of the aircraft and the case eventually went to court where damages of more than $21,000 were assessed against the crown.

After this accident a Northrop "Delta" was allotted to the "Hurricane" detachment so that the pilots could receive some dual

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(21) AFGO 33/39, effective 30 June 1939.
(22) AFRO 215/39, effective 1 August 1939, for the PAAF; AFRO 113/39, effective 1 April 1939, for the AAAF.
(23) There were also 10 RAF officers on exchange, holding temporary commissions in the RCAF.

instruction on a high-powered monoplane before soloing on the "Hurricane". When their Majesties King George VI and Queen Elizabeth visited Vancouver and Victoria at the end of May three "Hurricanes" of No. 1 Squadron escorted the ship carrying them across to Vancouver Island and back. On 8 June a flight of four pilots took off from Sea Island to ferry some of the "Hurricanes" to the squadron base at Calgary. En route another of the fighters was lost when F/O T.G. Fraser crashed near Mission, B.C., and was killed.

In addition to the "Hurricanes" delivered to No. 1 Squadron, the RCAF also received some "Stranraer" flying-boats before hostilities began. The first twin-engined "Stranraer" was delivered by F/L L.E. Wray to Rockcliffe early in November 1938 and subsequently was ferried by S/L F.J. Mawdesley and crew to No. 5 Squadron at Dartmouth. By the spring of 1939 the squadron had received four of the new boats which were used to escort the royal visitors on their arrival and departure. No. 4 Squadron at Vancouver received its first "Stranraer" on 16 July, S/L Mawdesley ferrying the aircraft in from eastern Canada.

Other acquisitions were the first Airspeed "Oxfords" in May 1939, and a consignment of eight Fairey "Battles" which arrived, in crates, at Camp Borden on 21 August.(24) For communication work a Grumman "Goose" was delivered to No. 7 Squadron at Rockcliffe late in July 1938 and was soon being used extensively to carry V.I.P.s about the country. Some Noorduyn "Norseman" aircraft had also been acquired early in 1938, and in the last weeks of peace, in August 1939, deliveries of the first North American "Harvard" trainers began.

When the RCAF went to war its aircraft strength, including obsolete types in storage, totalled 270. By types there were:

Service aircraft (92)

Hawker "Hurricane"	19
Armstrong Whitworth "Siskin"	5
Armstrong Whitworth "Atlas"	13
Westland "Wapiti"	22
Fairey "Battle"	10
Blackburn "Shark"	11
Vickers "Vancouver"	4
Supermarine "Stranraer"	8

Photographic and communications aircraft (48)

Fairchild 51	7
Fairchild 71	15
Fairchild Super 71	1
Bellanca "Pacemaker"	8
Northrop "Delta"	12
Noorduyn "Norseman"	4
Grumman "Goose"	1

Training aircraft (130)

de Havilland "Moth"	7
de Havilland "Tiger Moth"	23

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(24) In erecting the "Battles" use was made of an old gantry which had been received with the gift of equipment from the United Kingdom in 1920.

Fleet "Fawn I"	14
Fleet "Fawn II"	27
Avro 621	7
Avro 626	7
Hawker "Tomtit"	2
Vickers "Vedette"	9
North American "Harvard"	14
Airspeed "Oxford"	20

The Permanent squadrons were equipped as follows:

No. 1 Squadron - "Hurricane"; No. 2 Squadron - "Atlas"; No. 3 Squadron "Wapiti"; No. 4 Squadron - "Vancouver" and "Stranraer"; No. 5 Squadron - "Stranraer"; No. 6 Squadron - "Shark"; No. 7 Squadron - various types; No. 8 Squadron - "Delta".(25)

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(25) Aircraft on order included 18 Bristol "Bolingbroke", 28 Westland "Lysander", some Grumman two-seater fighters, and Douglas "Digby" bombers, as well as more "Deltas", "Harvards, "Sharks" and "Stranraers".

C. Operations

Royal Visit

Highlight of the last few months of peace was the visit to Canada of Their Majesties King George VI and Queen Elizabeth. The Royal Canadian Air Force contributed to the many ceremonies which welcomed the royal guests from the time of their arrival on 17 May 1939 until their departure on 15 June. When the royal yacht entered Canadian waters three "Stranraer" flying-boats from No. 5 Squadron provided an aerial escort up the St. Lawrence until the arrival at Quebec. While their Majesties were in residence at Government House in Ottawa, the junior service had the honour of furnishing the Royal Household Guard on 19 May. RCAF trumpeters and drummers played fanfares at the unveiling of the National War Memorial in Ottawa. At Trenton five "Wapiti" and three "Atlas" aircraft flew on escort for the royal visitors, and again at Vancouver an aerial escort of three "Vancouvers" from No. 4 Squadron, six "Sharks" from No. 6 Squadron and three "Hurricanes" from No. 1 Squadron accompanied the royal party on its voyage to Victoria and return. When the King and Queen visited eastern Canada again the "Stranraers" of No. 5 Squadron escorted them to Prince Edward Island and on their departure from Halifax. At many points along the royal route RCAF personnel helped to line the streets.

On leaving Canada, the King sent a farewell message in which he said, in part:

> "I regret that time has prevented me from seeing more of the Air Force. Faultless escorts I have seen and on more than one occasion Airmen and Air Force bands have contributed, second to none, to the pageantry of the streets. I am confident that the Air Force, though the youngest of the Services, has already established a tradition no less brilliant than that of the senior branches, and that before it, associated with the Air Development of this vast land, lies a great and vital future."

Photography

At the end of the 1938 season the RCAF was seriously considering the necessity of abandoning air survey activities. Defence needs were pressing "and the equipping and training of a complete squadron for purposes of air survey only must necessarily detract from the efficiency of so small a Service as the Royal Canadian Air Force insofar as its defence training is concerned." In 1938 it had been very difficult to bring No. 8 (G.P.) Squadron up to proper establishment because of the demands to train officers and airmen in service requirements so that they could take their place in service squadrons. Air survey duties were so highly specialized that they were not compatible with the duties of other squadrons, which meant that the personnel of No. 8 Squadron not only lacked training in service essentials, but were lost to service squadron use. Furthermore the maintenance and repair of survey aircraft took time and space which could be used for service aircraft. Under the circumstances it was "difficult to avoid the decision that the Royal Canadian Air Force must shortly abandon its air survey activities", and 1 December 1939 was suggested for the

termination of Civil Government Air Operations.(26)

No decision was made at the time and meanwhile plans proceeded for the 1939 season while the Interdepartmental Committee on Air Surveys and Base Maps drew up a program at its meeting in January 1939. Nevertheless concern over the dispersal of personnel and aircraft on photographic operations continued, and on 18 April 1939 the Chief of the Air Staff (A/V/M Croil) presented the case to the Deputy Minister. The allotment of No. 8 Squadron to civil government air operations that summer was "a cause of grave concern" because the international situation showed no sign of improvement. The program of work proposed would disperse the unit's aircraft to Aklavik, Hudson Bay and Cape Breton, thus delaying its concentration and reorganization should the squadron be required for active service. This situation was all the more serious because, in case of an emergency, the squadron would be required immediately for operations owing to the delay in delivery of service type aircraft until later in the year. At a discussion of the matter by the Chief of Staffs Committee earlier that day "it was unanimously agreed that the use of this squadron on civil government air operations should be cancelled", and A/V/M Croil accordingly asked that the Minister's approval be secured. The Deputy Minister so recommended and the Minister (Mr. Mackenzie) agreed. Ottawa station and Dr. Camsell were advised of the decision on 21 April.(27)

The operations that had been planned for the Northwest Territories were cancelled for the time being, but to avoid complete dislocation of the mapping work it was decided to give priority to those operations in areas of the Maritimes where maps were urgently required for defence purposes. Early in May 1939 No. 8 Squadron sent two detachments of two "Deltas" each to carry out photography around Truro, Sydney, Baddeck, Gaspe and Shediac. One detachment returned to Ottawa early in July, while the other flew to Moisie in Quebec where it was joined by two more "Deltas" in a month-long search for a civil aircraft that was missing in Labrador.

Meanwhile the second detachment had set out again on another operation to make a detailed reconnaissance of the coast of Labrador in search of possible air base sites. The three aircraft, two "Deltas" piloted by F/S R.I. Thomas and Sgt. R. Gilmour and a "Norseman" flown by Sgt. S.D. Turner, left Rockcliffe on 14 July and picked up W/C G.E. Brookes before flying on to Newfoundland and Labrador. Before they returned to Ottawa on 14 August the crews visited and inspected Mary Harbour, Cartwright, Hopedale, Table Harbour, Rigolet, Pottles Bay, Halton Harbour, Makkovik, Canairektok Bay, Nain, Davis Inlet, Hebron and Port Burwell.(28)

While these "Deltas" were working in eastern Canada another aircraft (F/S A. Fleming, pilot) had been engaged on photographic

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(26) Draft letter prepared by S/L C.C. Walker for the Deputy Minister to send to Dr. Camsell, Chairman of the Interdepartmental Committee on Air Survey and Base Maps. The draft was referred to A/V/M Croil for approval on 9 December 1938, but he returned it with a note that the matter would have to be approved first by the Minister; he asked that a memo be prepared setting forth the situation fully for the Minister's information. AFHQ file 1008-1-13, vol. 2.

(27) Ibid.; folio 32.

(28) While at Cartwright the Labrador detachment took Sir Wilfred Grenfell on a flight.

operations for the Geographical Section, General Staff, from early May to mid-August. After completing some jobs around Petawawa, Camp Borden and Toronto, FS Fleming flew out to western Canada for other tasks at Regina, Moose Jaw, Saskatoon, and North Battleford. On this survey work the special 6-inch wide - angle Ross lens was thoroughly tested and proved superior to the lenses previously used.

While some of the squadron's aircraft were still in the field, the international situation became still more serious and at 1410 hours on 24 August the Chief of the Air Staff instructed the officer commanding No. 8 Squadron that all aircraft engaged on photography were "to return to Ottawa forthwith." The emergency which he had forseen was at hand; war was threatening and even the photographic aircraft were needed now for the defence of Canada. Civil government air operations were ended; military air operations were about to begin.

During the curtailed photographic season the detachment of No. 8 Squadron completed 19,200 square miles of aerial survey (185 rolls of film) for the Interdepartmental Committee on Air Surveys and Base Maps, and 5,900 square miles (52 rolls) for the Geographical Section, General Staff. The flying time was 424.35 hours. The small aerial camera which had been developed by the National Research Council satisfactorily passed its ground tests, but the air tests, which had been scheduled to commence on 24 August, could not be undertaken due to preparations to move all aircraft to their war stations.

D. Training

Service training

Prior to the outbreak of hostilities the service squadrons carried out normal training and co-operation exercises. Nos. 1, 2, 3, 4, and 5 Squadrons were engaged in training according to RAF syllabi for their respective roles, and No. 6 began torpedo-dropping training at Vancouver. Nos. 2 and 3 Squadrons engaged in co-operation exercises with Militia units at summer camps in eastern and western Canada, while Nos. 4 and 5 took part in exercises with the RN and RCN on the two coasts. A course in navigation reconnaissance and naval co-operation was given at Dartmouth for fourteen officers by F/L R.C. Gordon who had recently returned from an exchange tour with the RAF on bomber reconnaissance duties. During the year a meteorological service was established on the east coast, in conjunction with the Department of Transport, similar to the service initiated the previous year on the west coast.

Seven Auxiliary squadrons, in addition to regular nightly and week-end training during the year, received service training during a fortnightin annual camp at Sea Island (No. 111), Calgary (No. 120), Shilo (No. 112), Camp Borden (Nos. 115 and 119), and Trenton (Nos. 110 and 118). The other five Auxiliary units, Nos. 113, 114, 116, 117 and 121 Squadrons, had not been organized sufficiently to permit preliminary training to commence; following the outbreak of war they were used briefly for recruiting purposes and their organization was then discontinued, the personnel being distributed among other units.

The total service flying carried out in the five months prior to the war was 7104 hours by the PAAF and 4820 by the AAAF.

Flying training

To train elementary instructors from civil flying clubs to the standard required for the new tri-phase pilot training scheme, a Flying Instructors' School was opened at Camp Borden in April 1939 with F/L G.P. Dunlop and F/O R.C. Ripley as two of the instructors. The first course was completed on 19 May.(29)

After the instructors had been trained the elementary phase of the new training scheme was inaugurated on 5 June 1939 when 33 pilot officers (provisional) were appointed to the Auxiliary and posted to eight civil flying clubs at Halifax, Montreal, Toronto, Hamilton, Winnipeg, Regina, Calgary and Vancouver for ab initio training on "Tiger Moths". Three pupils withdrew during this stage of the course. The other 30 were transferred to Camp Borden on 28 August for the intermediate phase, during which three more dropped out. On 30 October the 27 graduates received their pilot's flying badge at Camp Borden in the service's first war-time wings parade. The graduates were P/Os J.O. Alexander, M.J. Andrews, V.L. Berg, R.S. Blackler, J.E.R.P. Bussiere, A.M. Cameron, C.G.W. Chapman, T.H. Christie, L.A. Clements, F.B. Curry, D.L. Forbes, D.C. Horne, J.J.A.V. Lalonde, J.G. Lee, P.W. Lochnan, G.T. Maher, D.F. Manders, H.R. Monon, G.H. Newsome, W.F.M. Newson, R.W. Norris, P.T. O'Leary,

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(29) After war began the F.I.S. was moved to Trenton on 22 January 1940.

A.P.W. Richer, G.B. Snow, H.C. Vinnicombe, L.G.R. Virr and E.M. Williams.(30)

Meanwhile the new intermediate stage had been instituted at Camp Borden at the beginning of May with a course of 36 pilot officers (provisional) and three airmen who had done their elementary training at Trenton. The major part of this course had started training in November 1938, and was joined in January 1939 by a second group of 15 who were candidates for short service commissions in the Royal Air Force. One member of this intermediate course, P/O (P) E.E. Devlin was killed in a flying accident on a Fleet near Cookstown, Ontario, on 24 July 1939, while practising formation flying. On 2 September 1939 the three NCOs and 28 of the officers qualified for their pilot's flying badges at Camp Borden, in the last wings parade before the war began. Because of the outbreak of hostilities the RAF candidates in this course remained with the RCAF. Those who received their wings were P/Os R.A. Ashman, G.S. Austin, H.A. Beer, B.E. Christmas, H.K. Corbett, R.L. Edwards, W.M. Foster, M.W. Gall, R.J. Gray, P.D. Iverson, H.L. Kay, J.W. Kerwin, J.H.U. LeBlanc, H.C. Ledoux, J.K.F. MacDonald, W.B.M. Millar, G.T. Mitchell, E.W.J. Morris, O.J. Peterson, L.B.B. Price, R.N. Rand, G.J.C. Reid, J.W. Reid, J.B. Reynolds, J.G. Richardson, W.M. Smith, A.B.C. Weatherwax, and J. Woolfenden, and Sgts. F. Pafford, R. Smither and D.V. Thomas.(31)

Simultaneous with the intermediate course at Camp Borden the advanced training phase of the new scheme was started at Trenton with a course of 30 officers and three airmen(32) who began training on 15 May 1939, using "Norseman", "Wapiti" and "Oxford" aircraft. A month later all 33 members of the course qualified for their wings (17 June 1939), but the course continued until the end of August. The members of this pioneer advanced training course were P/Os (P) F.W. Ball, A.P. Blackburn, R.A. Butts, A.J. Chevrier, E.W. Cowan, P.S. Delaney, R.R. Dennis, E.R. Johnston, W.C. Kent, A.G. Kenyon, A. Laut, M. Lipton, K.F. MacDonald, J.W.D. McKnight, G.E. McMurtrie, G.M. Martin, M.P. Martyn, S.R. Miller, B.A. Power, L.H. Randall, W.A. Rider, C.G. Ruttan, G.W. Ryall, J.C. Scott, F.R. Sharp, R.O. Shaw, J.G. Stephenson, W.C. VanCamp, J.C. Wickett, C.A. Willis and Sgts. S. Broadbent, B.G. Miller and A.M. Sharp.

When the first advanced course ended, a second course began at Trenton on 6 September, consisting of the 32 pilots who had just completed the intermediate phase and received their wings at Camp Borden. Advanced training continued at Trenton until 20 January 1940 when the Advanced Training Squadron was transferred to Camp Borden to be merged with the Intermediate Training Squadron in No. 1 Service Flying Training School.

Three months after the first course of elementary trainees was taken on strength, in June 1939, another intake of 61 pilot officers

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(30) P/Os Clements, Lee and Maher and an airman were killed in a flying accident on an "Oxford" at Trenton on 29 November 1939.
(31) P/O (P) Corbett and P/O (P) G.J. Olstead, who had won his wings on 9 August 1939, were killed in a flying accident on a "Battle" near Snow Road, Ontario, on 14 October 1939; it was the second flying accident in the service after war was declared. Three other members of this course, F/Os Edwards, Smither and Peterson, were the first members of the RCAF to give their lives in action with the enemy; all three were shot down and killed during the Battle of Britain in 1940 while serving with No. 1 Squadron.
(32) This was the intake of 4 July 1938.

(provisional) was appointed to the Special List of the Auxiliary General List on 9 September, on the very eve of Canada's entrance into the war that had already begun in Europe. Six months later, on 28 February 1940, 35 members of this group received their pilot's wings.(33)

For six weeks during the summer of 1939 (20 June to 31 July) seventeen Gentleman Cadets from RMC were granted temporary commissions as pilot officers (provisional) on the Auxiliary Non-Flying List and were posted to Ottawa (nine), Calgary (four), Vancouver (three) and Dartmouth (one) for training. A number of this group subsequently joined the RCAF and served during the war.(34)

Late in 1938 provision was made for the training of airmen as air observers.(35) No training was actually introduced in the RCAF until the BCATP began, but on 1 February 1940 fourteen NCOs who had qualified as air gunners in pre-war years were remustered as air observers and became the first RCAF personnel (except for veterans of the Great War) to wear the flying O badge.(36)

Medical services

There were eleven officers and 38 other ranks of the RCAMC on duty with the RCAF in the months immediately preceding the declaration of war. There were two fatal flying accidents in the summer of 1939 in which two officers were killed; these were the last casualties before hostilities began.

Expenditures

In the first five months of the 1939-40 fiscal year the RCAF spent only a small part of the appropriation of almost $30,000,000 that had been voted for the air service. Late in August Civil Government Air Operations were suspended after $16,226 of the allotted sum of $325,050 had been expended; RCAF expenditures from other votes totalled only $4,835,277 at the end of August. The balance of more than $24,500,000 remaining in the votes was merged with the first war appropriation of $8,950,000.

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(33) Under the short service commission scheme which was introduced in August 1939, 126 pupils were selected for elementary training before the scheme was suspended for the duration of the war.

(34) E.g.: W.C. Connell, W.M. Doherty, C.W.J. Fernie, R.D. Forbes-Roberts, C.C.W. Marshall, K.L. Morham, H.C. Stewart, V.C.H. Stuart, I.M. Sutherland-Brown, J.J.M. Viau and D.B. Wurtele.

(35) See A.F.R.O. 413/38 and A.F.G.O.s 3 and 4/39. A.F.A.O. A51/15, setting forth the qualifications for air observers, was issued on 30 November 1938.

(36) They were FSs C. Bendall, D.H. McLean, G.B. Randall, G. Tough, J.H. Watts and R.J. Wilcock, Sgts. F.L. Benson, S.G. Cable, G.T. Johnson, R.A. Plant, A.N. Roth, K.W. Walton, A.P. Whalen and P. Wilkinson.

E. Mobilization for War

Through the summer of 1939 the international situation steadily deteriorated as Hitler's verbal attacks upon Poland rose to a frenzy. On 21 August Germany and Russia signed a non-aggression pact in Moscow, and three days later the Royal Air Force began to mobilize. On the afternoon of the same day (24 August) the RCAF took its first steps to prepare for an emergency by ordering the photographic aircraft of No. 8 Squadron to return to base at Rockcliffe. The next day all leave was cancelled and the squadrons began preparations to move to their war stations.(37) Nos. 4, 5 and 6 Squadrons were already at their stations on the two coasts, but the inland units, Nos. 1, 2, 3 and 8 Squadrons, had considerable distances to move to reach their war posts.(38)

On 26 August S/L W.W. Brown, o.c. of No. 8 Squadron, flew from Rockcliffe to Halifax to arrange for the reception of his unit there, and an advance party set out by rail the same day, while the remainder of the personnel "worked feverishly and with some confusion to complete packing of the squadron equipment." On the 27th six "Deltas", flown by NCO pilots, followed their commanding officer eastward; three reached Shediac safely before nightfall, another landed at Bathurst, and the remaining two at Norcross in Maine. One of the latter aircraft had been forced down with engine trouble and the second machine landed to assist it. When S/L Brown reported to Eastern Air Command Headquarters on the afternoon of the 27th he was instructed to take his unit to Sydney immediately. He arrived at the new base that evening and was joined by the advance party and five of the "Deltas" the following day; the main party of the squadron reached Sydney on the 29th. The situation at the new base was far from ideal for active service operations and great difficulties had to be overcome in getting settled. One handicap was that the squadron had only three officers on strength. Furthermore its crews, engaged for several years on photographic operations, had had no air firing or bombing practice and no training in coastal reconnaissance which was the role now assigned to No. 8 with its redesignation as a bomber reconnaissance squadron. Nevertheless, on 4 September two crews (F/S Thomas and Sgt. Gilmour) were detached to Newfoundland to reconnoitre the coast and inlets for suspicious vessels, and on 7 September the squadron began flying routine patrols over the sea from Sydney.

F/S J.E. Doan and LAC D.A. Rennie, the crew who had been forced down at Norcross in Maine with engine trouble, made repairs to their aircraft and on 31 August took off, only to be forced down again at Megantic in Quebec. The "Delta" remained there for a fortnight, undergoing further repairs. On 14 September Doan and Rennie made another attempt to get through to Sydney, but vanished en route and a prolonged search extending over several weeks found no trace of the missing aircraft and men. They were subsequently presumed dead, the first casualties sustained by the RCAF in the

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(37) As early as 17 August No. 3 Squadron at Calgary received a warning order from Western Air Command to be ready to move its aircraft on 24 hours' notice and its ground equipment within 48 hours.

(38) No. 7 Squadron, engaged on test and communication work and not equipped with operational aircraft, was not effected; it quietly "folded up" early in September.

Second World War.

From Trenton No. 2 Squadron had also moved to the east coast. At 1800 hours on 24 August W/C G.V. Walsh at Air Force Headquarters telephoned instructions to S/L W.D. Van Vliet to prepare to leave the same night if possible, and at 2230 the squadron reported the air party was ready to depart. Ordered then to stand-by on one hour's notice, the squadron received further instructions the next morning that it was to begin moving to 0600 on the 26th. At the appointed hour eight "Atlas" and one "Norseman" aircraft, carrying nine officers and twelve airmen, took off from Trenton, followed a few hours later by a road party of two officers and thirteen airmen and a rail party of two officers and 84 airmen. The air party, led by S/L Van Vliet, landed at Ottawa, Montreal, Megantic and Millinocket to refuel; at the latter point there was so much delay in servicing the aircraft that the party had to remain overnight. On the 27th, staging through Blissville and Moncton, the aircraft reached Halifax at 1630 in the afternoon. One flight remained at Halifax, where it was augmented by the personnel of No. 116 Squadron (Auxiliary); the remainder of No. 2, with four "Atlas" and the "Norseman", was transferred to Saint John, N.B., on 1 September.

The longest moves were those made by Nos. 1 and 3 Squadrons at Calgary. The former unit had just returned to Calgary at the beginning of June, after converting to "Hurricanes" at Vancouver. Late in August S/L E.G. Fullerton and Sgt. C.E. Briese ferried two of the "Hurricanes" eastward, reaching Ottawa on 2 September. A rail party, with several boxcars loaded with equipment, left Calgary on 31 August and reached Ottawa a day after their commanding officer. From Rockcliffe the squadron then moved to St. Hubert, on 9 September, where it was mobilized for war. More personnel were posted in, more "Hurricanes" delivered, and on 3 November seven fighters, led by S/L E.A. McNab, the new C.O., left St. Hubert for Dartmouth.(39)

No. 3 Squadron's move was the most eventful of them all. On 17 August it had received a warning order to be ready to leave on 24 hours' notice. Nine days later the call came. At 1100 hours on the 26th telegraph orders were received to proceed immediately to Halifax, and within three hours seven "Wapitis", led by S/L A. Lewis, were on their way eastward.(40) Leaving a detachment behind to assist in training No. 113 Squadron (Auxiliary), the remainder of No. 3 (78 personnel) departed by train the same day and reached Halifax on the evening of 1 September, a few hours after the first aircraft.

The air party reached Swift Current the first evening (26 August), passed through Regina the next day and stayed overnight at Winnipeg, while the seven crewmen worked until almost midnight to service the aging "Wapitis". After being delayed by the weather for several hours on the 28th, the aircraft finally got through to

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(39) When Nos. 2, 3 and 8 Squadrons flew to the east coast late in August, while Canada was still at peace, the aircraft had followed the direct route across Maine. When No. 1 Squadron made its move, after the declaration of war, it had to "detour" by way of Rimouski and Moncton to avoid neutral U.S. territory.

(40) As the squadron had only six pilots on strength, it had to borrow one pilot from No. 1 Squadron for the flight. The seven aircraft had all made the flight from Ottawa to Calgary the previous year.

Sioux Lookout where the crews had to bed down for the night in their sleeping-bags, no other accommodation being available. On the fourth day (29 August) two legs were flown, to Nagaming and Kapuskasing, and on the 29th two more legs brought the air party through North Bay to Ottawa. Here the seven aircraft were given a thorough inspection by the crewmen assisted by station personnel, the work lasting until 0200 the next morning.

At Ottawa the squadron was reinforced by three "Wapitis" and crews from Trenton, and the air party was divided into two flights of five aircraft for the remainder of the trip to Halifax. On the morning of 31 August the two flights left Rockcliffe and refuelled at Megantic. "B" Flight, led by F/O C.L. Annis, reached Moncton safely late that afternoon and landed at Halifax early in the afternoon of 1 September. But "A" Flight, led by S/L Lewis, ran into trouble as it was crossing over Maine; two of the aircraft had engine trouble and the whole group put down at Millinocket in Maine. For some time there had been a mutual agreement between Canada and the United States concerning the movement of service aircraft across the international border. These regulations, of course, applied only to peace-time movements and when the "Wapitis" landed at Millinocket Canada (and the United Kingdom) were still at peace, but it seemed very unlikely that that condition would persist many days longer. As a result there was considerable concern at Air Force Headquarters and much wire-burning between Ottawa and Washington to get the aircraft on their way again before they and their crews were interned.

On 1 September S/L Lewis and two of his pilots flew the three serviceable "Wapitis" to Blissville and thence to Halifax. Late that afternoon a Fairchild reached Millinocket from Ottawa with two fitters and the necessary spare parts, and by the morning of the 2nd the sweating airmen had the two aircraft serviceable once more. But a low ceiling kept the "Wapitis" on the ground while Ottawa became more fidgety. The next day (3 September) the United Kingdom declared war on the Third Reich, and some American believed that that meant Canada too was at war - and Millinocket was still closed in. Finally, to everyone's relief, the two crews were able to get away late on the morning of the 4th and reached Blissville - and safety from internment. Delayed there by the weather, the two stragglers eventually reached Halifax on 6 September.

Pending completion of the airfield at Dartmouth, No. 3 Squadron used the civic airport at Halifax for its operational base, sharing the facilities there with a flight of No. 2 Squadron, the Halifax Aero Club, and commercial aircraft. Personnel were billeted in private homes, while two marquees and two tents were erected on the northeast side of the aerodrome to serve as offices, storehouses and workshops on the crowded airfield. A bomb dump was also established and the squadron began practice flying for its role as an "air striking force" to work in co-operation with the Royal Canadian Navy, or independently, against any enemy forces within range in the area between Port Mouton and Cape Canso.

The arrival of No. 3 Squadron at Halifax also marked its termination under that designation. While the squadron was in transit to the east coast an order was issued redesignating it as a fighter squadron. This rather curious development was subsequently clarified by another order which explained that it was not intended to convert No. 3 to a fighter role, but to redesignate it No. 10 (Bomber) Squadron. In this left-handed manner No. 10 Squadron officially was christened on 5 September 1939.(41)

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(41) See AFGO 41/39 and AFRO 294/39.

While Nos. 1, 2, 3 and 8 Squadrons were moving to war stations on the east coast, the original (and hitherto only) squadron in Eastern Air Command, No. 5, based at Dartmouth under the command of S/L A.D. Ross, had started precautionary patrols with its "Stranraers" on 2 September and continued them daily until Canada declared war. On the west coast No. 4 Squadron sent a detachment to Alliford Bay, on 4 September, to establish radio communication with base and make weather observations. War operations began on 12 September when two aircraft carried out a coastal patrol. No. 6 Squadron, also based at Vancouver, had just started torpedo training in June of that year; on 2 September its "Sharks" began regular patrols to report and identify shipping in the Strait of Georgia. These continued for ten days and the squadron then reverted to stand-by as a striking force with two aircraft detached to Ucluelet; some escorts were also flown for vessels entering and leaving Vancouver harbour. The tension of the early war days produced several submarine scares, the first occurring on 10 September, the day that Canada declared war. All proved to be false alarms; one "U/boat" which W/C Hull went out to investigate turned out to be a rock with a light on it!

After the Permanent Force squadrons began moving to their war stations, Air Force Headquarters took the necessary paper action to call out the Auxiliary and Reserve for full time air force duty and place the RCAF on active service. On 3 September the three wing headquarters and eleven squadrons of the Auxiliary Active Air Force (i.e. all units except No. 121 Squadron) were placed on full time air force duty.(42) The next day all officers and airmen of the PAAF and Nos. 110, 111, 112, 115, 118, 119 and 120 Squadrons of the AAAF were placed on active service, effective 1 September.(43) Two days later (6 September) the minister was authorized to call out and place on active service such officers and airmen of the Reserve Air Force as might be required.(44) Finally, on 8 September, the three Auxiliary wing headquarters and Nos. 113, 114, 116 and 117 Squadrons were called out and placed on active service as from 4 September 1939.(45)

This was the situation when Canada declared war on 10 September. Subsequently, under authority of P.C. 2677 of 14 September, a Special Reserve Royal Canadian Air Force was created for the great flood of war-time recruits and all three components - Permanent, Auxiliary and Special Reserve - were "placed on active service in Canada and also beyond Canada, for the defence thereof" as from 13 September.(46)

Hostilities, and the great expansion of the Force, naturally involved many changes in the organization of Air Force Headquarters. One of the first changes was the formation of a Directorate of Air Force Manning in the Air Personnel Staff Division on 15 September. A month later (21 October) the Air Staff Officer, Air Personnel Staff Officer and Chief Aeronautical Engineer were redesignated, respectively, Air Member for Air Staff, Air Member for Personnel, and Air Member for Aeronautical Engineering.(47) To these three Air Members a fourth was soon added, an Air Member for Organization

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(42) AFGO 42/39 (under authority of P.C. 2441 of 31 August 1939).
(43) AFGO 43/39 (under authority of P.C. 2500 of 2 September 1939).
(44) AFGO 45/39 (under authority of P.C. 2511 of 3 September 1939).
(45) AFGO 46/39 (under authority of P.C. 2532 of 5 September 1939).
(46) AFGO 50 of 19 September 1939; the four previous P.C.s (2441, 2500, 2511, and 2532) were cancelled.
(47) AFGO 56/39.

and Training, whose division absorbed the Air Organization branch of AMAS and the Air Personnel Training Directorate of AMP. The new AMOT division was initially subdivided into Directorates of Air Organization, and Training (which comprised sections for flying training, specialized training, and technical training).(48)

(48) The effective date of the formation of AMOT was 6 November 1939.

Chapter XXIV

Civil Aviation

The Certificates Branch under Lt.-Col. Scott, which was soon redesignated the Controller of Civil Aviation Branch,(1) was charged with adminstering the Air Regulations which went into effect on 17 January 1920. The first year's experience proved that the regulations were "completely satisfactory in practice, and sufficient for the control of civil aviation in the Dominion." The only modifications necessary were the banning of dangerous flying by pilots carrying passengers, a practice which had been responsible for most of the accidents reported.

The post-war years witnessed a "boom" in flying in Canada, most of it "barn-storming" by ex-war pilots who bought war-surplus "Jennies" at bargain prices and flew from pasture to pasture carrying passengers as long as the thrill lasted. Lt.-Col. Scott and his certificate examiners, Majors B.D. Hobbs and L.S. Breadner and Capt J.A. LeRoyer, were busy checking the qualifications of pilots, engineers and navigators, the airworthiness of aircraft, and the suitability of air harbours opened by enterprising municipalities, companies or individuals. In 1920 permanent certificates were issued to 78 commercial pilots, 53 private pilots, and 66 engineers; 111 aircraft were registered, and 16 air harbours approved.(2) Thirty firms were engaged in operating aircraft, with three more using them as an auxiliary service. One company was manufacturing aircraft, and two were jobbing them. During the year, 18,671 flights were made for a total of 6,505 hours and an approximate mileage of 422,462; 15,265 passengers were carried and 6,740 pounds of freight. Fourteen accidents were reported, five of which resulted in fatalities and four in injuries; courts of inquiry were held to determine the causes of all serious accidents. The Certificates Branch also carried out surveys of potential air routes for landplanes and seaplanes and encouraged municipalities to establish aerodromes, in some cases landing spare Bessonneau hangars. To assist the U.S. Army Air Service's expedition from New York to Nome, an officer of the branch was attached to the advance party to obtain information about the Canadian part of the route.(3)

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(1) The change was made in November 1920 at which time the Superintendent of Flying Operations was also redesignated Director of Flying Operations.

(2) 284 temporary certificates were also issued, pending issue of permanent certificates. See Air Board Report for 1920; p.6.

(3) This was Capt J.A. LeRoyer who accompanied Capt H.T. Douglas of the US Army Air Service to Whitehorse on 18 June 1920. Their DH 4 was the first aircraft to land at the Yukon town. Two months later the American expedition led by Lt Col St. Clair Streett passed through Whitehorse on its way to Nome.

In 1921 the post-war "boom" in civil and commercial aviation began to subside. The number of commercial flights (excluding private flying) dropped to 10,386 for a total of 4347 hours, covering approximately 294,449 miles. Passengers carried also decreased to 9,153, but there was a very striking and encouraging increase in air freight to a total of 79,850 pounds. In civil flying there were three fatal flying accidents which resulted in four deaths.

The decline which had started in 1921 was even more marked, statistically, in 1922. The number of flights decreased to 4,415, flying hours to 2,541, mileage to 185,211, and passengers to 4,282 - figures that were 38% to 58% below those of the previous year. Only the volume of air freight remained constant, including 14,681 lbs. of freight and express, and 62,025 lbs. of mail carried on the run between Vancouver, Victoria and Seattle by an American company. The Air Board, however, felt that these statistics were misleading as they did not reveal the real progress made during the year. "Aviation in Canada is progressing steadily and not retrograding, as would appear from a casual comparison of the 1922 summary with those of the previous years." Indeed 1922 was "the most successful so far, judging from the results obtained." The amount of useful work done by aircraft had increased enormously, more than half of the flying being on forest patrol and survey, photography, air mail, transportation and similar tasks whereas only one-sixth of the flying in 1921 had been on useful work. "Joy-riding" and exhibition flying, which it is true had done much to popularize flying, were now suffering "the inevitable reaction to the post-war boom" and were being replaced by commercially useful types of flying.

Much of this useful commercial work in 1922 was done by three companies on forest survey in Ontario and Quebec; one was a lumber company which used aircraft as subsidiary to its main operations, and the other two were companies operating under contract for the Ontario government and several large pulp and paper firms. Another interesting development of the year was in British Columbia where a company used aircraft under contract to transport men and supplies from a base in the northern part of the province to mining camps located in remote areas to which canoe, packhorse and dog train had previously been the only means of transportation. In eastern Canada a Montreal firm used flying-boats during the summer and ski-equipped aircraft during the winter for flights from Cochrane to Moose Factory on Hudson Bay; the average flying time between the two points was about 2½ hours, as compared with 11 days by dog team in winter or canoe in summer. Most encouraging was the fact that all these commercial operations were completed without one fatal accident - "an excellent testimonial to the personnel engaged ..... and .. evidence of the care taken to maintain the machines in an airworthy condition."

Surveying the commercial aviation scene at the close of its three and one-half years of existence, the Air Board summed up its views:

> "The success of aviation will be assured just as soon as the public cease to regard flying as a 'stunt', and come to look upon it solely as a normal method of transportation having its particular

sphere of usefulness just as trains, steamers and motors each have their special fields. Canada has perhaps a larger field where aircraft can be used to advantage than any other civilized country, so that the future should be bright for commercial avaition in the Dominion."

The progress made in commercial aviation in Canada since the armistice had been disappointing "to those who looked for immediate changes in methods of transportation owing to the development of aircraft during the war." In the first post-war years aircraft had been cheap, pilots enthusiastic and the public interested, with the result that many companies sprang up to engage in 'joy-riding'. But once the first wave of interest and curiosity had subsided most of these little companies had ceased for lack of business. On the other hand steady progress had been made in the development of flying operations which were of practical use and would prove of permanent value to the community. "It was a sound development and self-supporting..... a natural growth along useful lines and not artificial or forced into non-economic channels by state aid or subventions. By the foresight and initiative of a small number of men interested in commercial aviation sound foundations for aerial transportation and an aircraft industry were being quietly laid." Further development in the immediate future, the Air Board believed, would be in the use of aircraft by firms, such as pulp and paper companies, whose operations covered large areas where communications were uncertain, slow and laborious, rather than in the operation of express, mail or passenger routes in a country such as Canada where large centres of population were few and often separated by wide tracts of unsettled territory.(4)

Upon reorganization of the air services in 1922 which consolidated all phases of the Air Board's work under the Director of the Canadian Air Force, the control of civil aviation became a responsibility of the Assistant Director and Secretary (Mr. J.A. Wilson) with S/L L.S. Breadner filling the position of Controller of Civil Aviation.(5)

The decline in civil aviation which had followed the post-war boom began to level off in 1923. There were fewer flights than in the previous year, but the number of flying hours increased slightly as did the volume of freight.(6)

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(4) Air Board Report for 1922; pp. 8 - 16.

(5) He became Acting Controller in July 1921 in succession to W/C Scott when the latter went on duty as CO, CAF, and on 1 July 1922 was appointed CCA.

(6) See statistics in Appendix.

The "gypsy" flyer, or barnstormer, who had dominated the aviation scene during the first two or three years after the war, was dropping more and more out of the picture; "joy-riding" was giving way to aerial operations of practical value to the country, as a marked increase in seaplane mileage indicated. Particularly noteworthy was the expansion in the use of aircraft in Ontario and Quebec for forest patrol, sketching and photography. Four major companies - Laurentide Air Services Limited, Fairchild Aerial Surveys Company (of Canada) Limited, Dominion Aerial Exploration Company, and Ontario Pulp and Paper Company - were now active in that area and there were several other companies in other parts of the Dominion. (7)

The aircraft industry was also beginning to grow slowly. Hitherto, while the stocks of surplus war aircraft were being used up, there had been little demand for such an industry except for reconditioning and repair. A new development began, however, late in 1922 when the Canadian Air Force ordered eight Vickers "Viking" amphibians, six of which were built in that company's Canadian plant at Maisonneuve, Montreal, during 1923. The Vickers company also undertook smaller contracts for commercial companies in the construction of floats, skis, spars, struts and fittings as well as general overhaul, erection and storage.

The supply of aircraft specifically designed to meet Canadian conditions and requirements promised to be a stimulus to the growth of a small domestic industry, but it was recognized that the demand for aircraft engines, instruments and accessories would not be large enough to justify the establishment of such industries in Canada for many years to come.

The International Commission on Air Navigation, which had been set up by the Peace Treaty in 1919, held its third meeting in Brussels in February 1923 and Canada was represented, indirectly, for the first time by W/C J.S. Scott who was attached to the staff of the British delegation. W/C Scott was in England at the time to attend RAF Staff College.

In 1924 the number of aviation companies decreased still further to a low of eight as more of the smaller companies and individual operators were forced out of business. The general situation, however, was one of improvement and progress out of the slump. The stronger companies that remained in the field were expanding their activities; they flew 4389 hours on 3776 flights and carried 5314 passengers and 77,385 pounds of freight - figures that were all encouraging increases over the previous year, particularly the freight traffic. Domestic air mail services were now beginning, 1221 pounds being carried, in addition to 44,800 on the international Victoria - Seattle run. There was only one fatal accident in which two passengers were killed.

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(7) For an account of their work see Report on Civil Aviation, 1923; pp. 13 - 19.

The aircraft industry was also progressing. British manufacturers were showing considerable interest in the Canadian market and were appreciating the need for construction of aircraft in the Dominion to meet Canadian conditions, particularly in the seasoning of wood. The most important company in the embryonic Canadian aircraft industry was Canadian Vickers Limited at Montreal (there were only two other companies in the field). In 1924 it completed further contracts for the RCAF, building two more "Vikings", constructing five single-seater Avro "Viper" fire-patrol aircraft for use at High River, and reconditioning five Avro dual control trainers. The most significant developments of the year were the addition of a designing staff to the establishment of the Vickers company as a result of the increase in government and civil business, and the appearance of the first product of that staff - the Vickers "Vedette". A small experimental three-seater flying-boat, the "Vedette" was the first modern aircraft designed and built in Canada to meet Canadian requirements. It was designed to fill the need for a photographic and fire patrol machine that would be more efficient for its horse-power, cheaper in first cost and more economical to operate than either the obsolete Curtiss HS2L or the Vickers "Viking". Launched late in October 1924, the "Vedette" passed its trials successfully, and gave "promise of development into an exceedingly useful type" (8) - a promise which it brilliantly fulfilled during the next decade.

A slight regression in civil aviation in 1925 (except in the field of air freight which showed an amazing increase of 700%) was followed by an upward swing in 1926. The next year, 1927, marked a turning-point in the history of civil aviation in Canada. The control and regulation of civil aviation which since late 1922 had been administered as an Assistant Directorate within the Royal Canadian Air Force was divorced from "military" control on 1 July 1927 and became a separate civil branch of the government's air services under a Controller of Civil Aviation (Mr. J.A. Wilson) who was directly responsible to the Deputy Minister of National Defence. For the next nine years, until the Department of Transport was formed late in 1936, the administration of air regulations, the inspection and registration of aircraft, the inspection and licensing of air harbours, and the examination and licensing of pilots and air engineers was the responsibility of the CCA branch of the Department of National Defence. (9)

There were other significant developments in 1927. Striking increases were reported in the number of companies operating aircraft, the number of aircraft and pilots licensed,

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(8) Report on Civil Aviation, 1924; p. 83. The prototype was fitted with a V-type engine; production models had a radial engine. A photograph of the prototype is given ibid., p. 80.

(9) Although the CCA branch was under civil control and staffed by civil servants, two RCAF officers, S/L Tudhope and F/L Cowley, were attached to it for duty.

and particularly in the number of flights, hours flown, and passengers, freight and mail carried. Some experimental air mail flights were made over the Rimouski - Montreal - Ottawa route to accelerate incoming and outgoing trans-Atlantic mails, and by the end of the year five domestic air mail routes were in operation under contract for the Post Office Department.

The formation of flying clubs was encouraged by the government which issued two light aircraft to each club under certain conditions and paid the clubs a grant of $100 for each pupil trained to qualify for a private pilot's license.

Plans were also made for Canadian participation in the development of imperial air routes. As a sequel to discussions on the subject at the Imperial Conference in October and November 1926 the Air Ministry was invited to send two experienced airship officers to Canada to assist in selecting a suitable site for an airship base. These officers, Major G.H. Scott and Mr. A.R. Gibbs, visited Canada in May and June 1927 and, accompanied by an RCAF officer, examined all likely areas from Sydney to Toronto. Their recommendation that the best site was at St. Hubert, some seven miles from the centre of Montreal, was accepted by the government, (10) the site was purchased in August and the Department of Public Works began preparation of the base for a airship mooring tower. It was intended to develop St. Hubert also for use as a public air harbour for the Montreal area, and the aerodrome was first used late in November 1927 when a Fairchild monoplane landed there with air mail from Rimouski.

The expansion of civil aviation, which had been so marked in 1927, gained still greater momentum in 1928, as a few statistics strikingly reveal. In 1927 there were 21 companies operating or using aircraft, 67 aircraft registered, and 146 pilots and air engineers licensed; for 1928 the comparable figures were 54 companies, 264 aircraft and 458 air crew. Flying hours rose from 12,070 to 43,071; passengers carried from 18,932 to 74,669, air freight from 1,098,436 lbs. to 2,404,682, and air mail from 14,684 to 316,631 lbs. Unfortunately the year was marred by an increase in flying accidents, not in northern flying "where one might expect it" but in operations in the settled areas. The explanation probably lay in the appearance of a new generation of pilots lacking the experience of the war-time generation most of whom were engaged on northern flying.

The close of the first post-war decade was marked by the inauguration of air mail services under contract for the Post Office Department, (11) the growth of the flying club movement with government assistance, progress on the airship base at St. Hubert, and the first awards of the "Trans-Canada Trophy" presented by Mr. J. Dalzell McKee for meritorious service in

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(10) PC 1233 of 24 June 1927.

(11) In earlier years some air companies had been allowed to fly mail into mining districts, for which they sold special "stickers".

the advancement of aviation in Canada. Capt. H.A. Oaks, DFC was awarded the trophy for 1927 and Capt. C.H. Dickins, DFC for 1928. Both pilots were on the staff of Western Canada Airways and had done outstanding pioneer service in the expansion of commercial aviation into the Canadian northwest.

Continuing its rapid expansion, civil aviation almost doubled its activities in 1929. Over 6¼ million miles were flown in 79,786 hours; and about 125,000 passengers, 4,000,000 pounds of freight and 430,000 pounds of mail were carried. The only disquieting feature was a rise in the number of accidents, due primarily to over-confidence and neglect of regulations. In properly organized flying, such as the mail service, northern "bush" operations, and the Ontario Provincial Air Service, the record was remarkably free of accidents. Considering the overall increase in the volume of the flying, the rise in the accident statistics was not out of ratio, but it did emphasize the need for the Controller of Civil Aviation branch to maintain constant vigilance for the enforcement of proper flying discipline.

Air mail services were expanded in 1929 with the addition of regular year-round services between Montreal and Detroit, Toronto and Buffalo, and in December an experimental service was begun over a route from Montreal to Saint John, via Quebec. Preliminary surveys had been started on other routes to complete a trans-Canada air mail service, and it was planned to open the western section between Winnipeg, Regina, Calgary and Edmonton early in 1930.

The light aeroplane club movement sponsored by the government continued to grow, seven new clubs being formed to make a total of 23 in operation.

In 1930 the world-wide depression in trade and industry began to make its effect felt and the rapid expansion of civil aviation which had started three years earlier lost momentum. There was as yet no retrogression, however, just a deceleration of pace. In fact in every field except transport of freight 1930 was the peak year of Canadian civil aviation since its start in 1919. More flights were made (156,574), hours flown (92,993), passengers carried (124,875) and mail delivered (474,199 pounds) over more miles (7,547,420) than ever before. The accident rate unfortunately showed little improvement with 28 deaths resulting from 17 accidents.

The highlight of the year was the inauguration of the airship base at St. Hubert which "brought to a successful conclusion Canada's participation in the first stage of the plan" that had been adopted by the Imperial Conference of 1926 for the development of empire communications by airship. The inaugural flight of H.M. Airship R. 100 to Canada had provisionally been set for late May 1930, but alterations to the dirigible made a month's postponement necessary. Then, because of the impending general election in Canada, the Dominion government requested a further postponement of a month. Finally, in the early morning of 29 July, while the ballots were still being counted in Canada, the airship slipped its moorings at Cardington, England, and headed westward across the Atlantic. Aided by favourable winds, the

R. 100 made good progress on the voyage until the lower gulf of St. Lawrence was reached. Then it encountered adverse winds and a violent storm which damaged the fabric of one fin; near Three Rivers a severe thunderstorm further delayed it. The dirigible arrived over St. Hubert after midnight of 31 July and circled about until early dawn, finally dropping its mooring cable at 0430 hours on 1 August. During the airship's visit to Canada it attracted at least a million visitors to the airfield at St. Hubert and aroused great interest throughout the country, particularly during a demonstration flight that it made over Ontario on 9 and 10 August, going as far west as Toronto and Niagara Falls. On the evening of the 13th the R. 100 left St. Hubert for the return flight to Britain, where it was safely moored at Cardington on the morning of the 16th. G/C Stedman, the Chief Aeronautical Engineer, was one of the passengers on the homeward flight. (12) Unfortunately the inaugural flight to Canada proved also to be the farewell flight for the empire airship service. Two months later, in the early morning of 5 October, the (R. 100's sister airship) the R. 101 was destroyed by fire in northern France while on its maiden flight to India. With it perished Britain's airship experts--and the dreams of linking the empire by airship routes. The mooring mast remained at St. Hubert for several years until it was finally demolished in 1938 as a hazard to flying. (13)

Of more permanent significance was a further expansion of Canadian air mail services in 1930 by the inauguration, on 3 March, of a service linking Winnipeg, Regina, Moose Jaw, Calgary and Edmonton. For his outstanding services in the development of these and other airways S/L J.H. Tudhope, MC, Superintendent of Airways in the Civil Aviation Branch of the Department of National Defence, was awarded the McKee "Trans-Canada Trophy" for 1930. He was the first RCAF recipient of that high award.

A South African by birth, Tudhope enlisted in the Imperial Light Horse in August 1914 and served throughout the campaign in German South-West Africa until November 1915. He then went to England where he later joined the Royal Flying Corps and, after winning his wings and a commission, was posted to a fighter squadron in France. His brilliant services in air combat with No. 40 Squadron between July 1917 and April 1918 were recognized by the award of the Military Cross and Bar. During the last months of the war he was employed as an instructor in Britain. On demobilisation in 1919 Tudhope came to Canada, worked for a short time in British Columbia and then, when the Canadian Air Force was formed, joined that service as a flight lieutenant. From November 1920 to September 1921 he instructed at Camp Borden, following

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(12) The westward flight to Canada took 78.52 hours, the homeward flight about 57 hours.

(13) The R. 100 was dismantled in 1931 and one of the steering wheels was presented to Mr. J.A. Wilson, the Controller of Civil Aviation in Canada.

which he was employed by the Air Board as a pilot at the High River air station until June 1923. Leaving the government service for a few months, he flew forestry patrols for the Laurentide Air Service in Quebec, and then in October 1923 returned to the RCAF to become commanding officer at Dartmouth for a year. Late in 1924 Tudhope crossed the continent to assume the same post at Vancouver where he remained until June 1927 when, upon reorganization of the government air services, he was appointed Superintendent of Airways in the Civil Aviation Branch.

The services for which he received the "Trans-Canada Trophy" included 234 hours flying by night and day to investigate air mail routes across Canada from Sydney, N.S. to Victoria, B.C., covering some of the worst flying country in the Dominion without accident or untoward incident. During the early part of the year, from late January to late March, S/L Tudhope surveyed the Rocky Mountain route, making numerous flights, chiefly in a little "Moth", between High River, Vancouver and intermediate points under weather conditions that were frequently adverse due to cold, rain, snow, low clouds and poor visibility. At the end of March Tudhope went to Wichita to take delivery of a Stearman biplane with which he made further flights across the Rockies before returning to Ottawa to survey the air mail route in eastern Canada to Moncton, Saint John and Sydney. The recommendation for the award to S/L Tudhope asserted that the successful inauguration of the air mail service throughout Canada was largely due "to the useful and pioneer work done by this officer in the course of duty."

The last five words--"in the course of duty"--epitomize not only the work of S/L Tudhope, and the basis upon which the McKee Trophy was awarded, but the work of Canadian airmen in general, in the government service and in the civil field. It was rarely spectacular stunt flying designed to catch the headlines. Much of it was worthy of far more publicity than it received, but for the men concerned their feats were just part of the day's work "in the course of duty"; their only concern was to do the job efficiently and safely, not to make copy for the newspapers.

Despite the depression civil aviation held its position fairly well through 1931. The number of flights, hours of flying, aircraft mileage and passengers carried dropped about 10%, but the weight of freight carried showed an increase of more than one-third, and the volume of air mail was about the same as in 1930 despite considerable curtailment of air mail services. The number of companies manufacturing or using aircraft remained unchanged - as did the accident ratio.

The highlight of the year 1931 in civil aviation was the Trans-Canada Air Pageant organized and directed by the Canadian Flying Clubs Association to stimulate interest in aviation throughout the Dominion. Starting at Hamilton, Ont., on 1 July, the Pageant travelled across Canada to Vancouver, returned to Hamilton and proceeded thence through the Maritimes before turning westward again to Cleveland, Ohio, and terminating at London, Ont., on 12 September. In all 26 performances were presented by the Pageant which consisted of 20

civil aircraft and an aerobatic flight of "Siskins" from the Royal Canadian Air Force.

In the field of aerial jurisprudence there was a major development in 1931 when the constitutional problem of the legislative and executive powers of the federal and provincial governments with respect to aerial navigation was finally settled. The issue had been raised by the Air Board Act of 1919 and the question was carried to the Supreme Court of Canada which held that the provinces controlled the air over them and the use of aircraft therein, except that the federal parliament had legislative power when aeronautics were used for Dominion purposes, such as defence or the postal service. This judgment was appealed to the Privy Council of the United Kingdom which, on 27 October 1931, reversed the Supreme Court's decision and ruled that the Parliament of Canada was, under the terms of the British North America Act, competent to pass the Air Board Act of 1919 and authorize the Air Regulations of 1920. (14)

The full effect of the economic depression was felt in 1932 and 1933, when the number of flights, hours and miles flown and passengers carried fell off by about 25% from the 1931 figures. An encouraging feature of the situation, however, was that the volume of freight transported by air rose steadily through these two years, while air mail, after a slight decrease in 1932, rose to a new peak in 1933. Then in 1934 the recovery set in and civil aviation began to recover the ground it had lost. More companies entered the field, exceeding even the pre-depression number; flights, flying hours, mileage and passengers carried rose appreciably, while air freight in 1934 showed an increase of more than three-fold over the previous year. This progress continued through 1935, and in almost every category the statistics of civil aviation were equal, or very close, to those of the peak year 1930; in two categories, freight and mail, the figures for 1935 were far ahead of those for any previous period.

The detailed annual Reports on Civil Aviation, which had been published by the Air Board and the Department of National Defence since 1919, were a victim of the depression and ceased with the issue for 1931. Through the next four years, 1932 to 1935, the annual Report of the Department of National Defence contained a very brief "Report on Civil Aviation", but this practice ceased in 1936 when the control of civil aviation was transferred to the new Department of Transport.

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(14) The text of Privy Council Appeal No. 38 of 1931 is published as Appendix A to the Report on Civil Aviation, 1931; pp. 74 - 82.

CIVIL AVIATION

	1920	1921	1922	1923	1924	1925	1926	1927
Firms manufac. aircraft	1	1	1	2	3	2	2	2
Firms chiefly operating a/c	30	27	23	15	8	8	14	20
Firms using a/c as auxiliary	3	2	1	1	2	2	2	1
Flights	18,671	10,386	4,415	3,086	3,776	3,171	4,755	16,748
Hours	6,505	4,347	2,541	2,831	4,389	4,091	5,860	12,070
Approximate mileage	422,462	294,449	185,211	188,098	294,778	255,826	393,103	829,010
Passengers carried	15,265	9,153	4,282	2,238	5,314	4,897	6,436	18,932
Freight and express (lbs.)	6,740	79,850	14,681	17,600	77,385	592,220	724,721	1,098,436
Mail (lbs.) (3)	-	-	62,025	16,672	1,221	1,080	3,960	14,684
Licensed aircraft	111	73	60	69	32	39	44	67
Licensed pilots (2)	131	139	71	171	31	36	38	72
Licensed air engineers	66	84	93	125	170	55	65	74
Unlicensed air mechanics	-	26	20	18	33	32	43	59
Fatal flying accidents	5	3	-	2	1	-	2	3
Total fatalities (4)	5	4	1	5	2	-	2	4

Notes: 1. Statistics include all flying except government and private-owned aircraft.

2. Licensed pilots includes pilot-air engineers.

3. Air mail figures for 1924, 1925, 1926 and 1927 do not include the Seattle - Victoria air mail service.

4. The one fatality in 1922 was a third party killed by an aircraft but not in a flying accident.

CIVIL AVIATION

	1928	1929	1930	1931	1932	1933	1934	1935
Firms manufac. aircraft	4	6	7	7				
Firms chiefly operating a/c	53	81	100	100	73	90	128	130
Firms using a/c as auxiliary	1	4	4	4				
Flights	75,285	144,143	156,574	144,080	102,219	106,252	128,031	153,211
Hours	43,071	79,786	92,993	73,645	56,170	53,299	75,871	88,451
Approximate mileage	2,728,414	6,284,079	7,547,420	7,046,276	4,569,131	4,538,315	6,497,637	7,522,102
Passengers carried	74,669	124,751	124,875	100,128	76,800	85,006	105,306	177,472
Freight and express (lbs.)	2,404,682	3,903,908	1,759,259	2,372,467	3,129,974	4,205,901	14,441,179	26,439,224
Mail (lbs.)	316,631	430,636	474,199	470,461	413,687	539,358	625,040	1,126,084
Licensed aircraft	264	445	527	495	348	345	368	380
Licensed pilots (2)	328	445	539	599	775	879	832	910
Licensed air engineers	130	212	241	236	341	403	461	472
Unlicensed air mechanics	85	150	164	131				
Fatal flying accidents	10	17	17	14	NOT REPORTED			
Total fatalities	17	31	28	27	NOT REPORTED			

Notes: 1. Statistics include all flying except government and private-owned aircraft.

2. Licensed pilots include - 1932: 419 commercial and 356 private pilots.
1933: 474 commercial and 405 private pilots.
1934: 405 commercial and 427 private pilots.
1935: 414 commercial and 496 private pilots.

Appendices

Appendix A

Gift Aircraft

Notes prepared in support of the Air Board estimates for 1920-21 contain several lists of gift aircraft received in 1920 with their estimated value. The lists do not appear to be entirely complete, and contain some variations in the value of the material. The following table depicts the minimum donation.

From Department of Militia and Defence	
10 Curtiss JN4 biplanes	$ 10,000
From Department of the Naval Service (donated by U.S.A.)	
12 Curtiss HS2L flying-boats (plus 10 extra engines)	175,000
Equipment, including 4 kite-balloons	200,000
From Overseas Club (replacements for wartime donations)	
8 F.3 flying-boats and spares	500,000
1 Fairey C.3 seaplane	22,500
From Air Ministry (100 aircraft and other equipment)	
62 Avro 504K biplanes and spares	800,000
12 D.H. 9 biplanes and spares	225,000
12 S.E.5 biplanes and spares	150,000
2 H.16 flying-boats and spares	100,000
1 Bristol Fighter biplane	12,500
6 Twin-type airships with spares, plant and hangars	1,500,000
Kite baloons with winches, lorries, etc.	600,000
Mechanical transport, machinery, etc.	850,000
Miscellaneous equipment	200,000
	$5,345,000

It would appear that 11 or more aircraft were still to be selected to make up the total number of 100 offered by the Air Ministry. Records indicate that the Air Board received at least 10 D.H.4s, another Bristol Fighter, and one Sopwith Snipe. The number of vehicles of various types was about 300.

Appendix B

CANADIAN AIR FORCE ASSOCIATION PROVINCIAL BRANCH

EXECUTIVE COMMITTEES

Maritime Provinces

Original Appointments	Appointed 1 April 1921
F/L LED Stevens, Chairman (24 June 1920)	Mr. WH Dennis
F/O IL Barnhill, Vice-Chairman (26 July 1920)	Mr. JO Hyndman
Mr. WH Dennis (26 July 1920)	P/O AE Stephenson
Mr. JO Hyndman (29 July 1920)	P/O HH Whitlock
Mr. AE Stephenson (31 July 1920)	F/L RA Logan
F/O ESE MacRae (21 June 1920)	F/L JLM White
P/O HH Whitlock (24 July 1920)	F/O A McGregor

F/L HR Stewart, Secretary

(F/O LPJ Roy replaced F/O McGregor on 2 May 1922)

Quebec

Original Appointments 28 June 1920	Appointed 1 April 1921
Lt Col JA Scott, Chairman	Lt Col JA Scott
Mr. E Greenwood, Vice-Chairman	Mr. E Greenwood
Mr. LHA Amyot	Mr. LHA Amyot
F/L CG Davidson	F/L CF Falkenberg
F/L CF Falkenberg	F/L GR Hodgson
F/L GR Hodgson	F/L FS McGill
F/L FS McGill	W/C RF Redpath

F/L Mostyn Lewis, Secretary

Ontario

Original Appointments 29 May 1920	Appointed 1 April 1921
Mr. Lloyd Harris, Chairman	Mr. Lloyd Harris
Lt Col RW Leonard	Lt Col RW Leonard
Sir John Aird	Sir John Aird
S/L D Hallam	W/C DG Joy
S/L DG Joy	F/L AJ Hember
S/L AM Shook	S/L BS Wemp
F/L AJ Hember	F/O WR Maxwell

F/L EG Joy, Secretary

Manitoba

Original Appointments 10 June 1920	Appointed 1 April 1921
Mr. DC Coleman, Chairman	Mr. DC Coleman
F/L FG Mathers, Vice-Chairman	Major EP Featherstonhaugh
Major EP Featherstonhaugh	Major CF Gray
Major CF Gray	F/L JH Cathcart
F/L JH Cathcart	F/L RE Spear
F/L FV Robinson	F/L AAL Cuffe
F/L RE Spear	F/L AA Leitch

Lt ED Hicks, Secretary (1920)

F/O FO Woodman, Secretary (1921)

(F/O FG Mathers replaced F/L Cuffe on the Committee later in 1921)

Saskatchewan

Original Appointments 22 June 1920	Appointed 1 April 1921
Brig-Gen GS Tuxford, Chairman	Brig-Gen GS Tuxford
F/L RA Delhaye, Vice-Chairman	Prof AR Greig
Prof AR Greig	Mr. James Balfour
Mr. James Balfour	F/L RA Delhaye
F/L JB Home-Hay	F/L JB Home-Hay
F/L JR Hopkins	F/L JR Hopkins
F/O AJE Sumner	F/L WFN Forrest

F/O TH Spence, Secretary

Alberta

Original Appointments	Appointed 1 April 1921
Lt-Govr RG Brett, Chairman (8 April 1920)	Lt-Govr RG Brett
F/L FR McCall, Vice-Chairman (9 June 1920)	Mr. AH Clarke
Mr. AH Clarke (9 June 1920)	Dean WAR Kerr
Dean WAR Kerr (9 June 1920)	F/L FR McCall
F/L DA MacRae (9 June 1920)	F/L DA MacRae
F/O HW Gee (9 June 1920)	F/O GW Gorman
F/O GW Gorman (9 June 1920)	F/L WR May

F/L DA MacRae, Secretary (1920-21)

P/O CH Dickins, Secretary (1922)

(S/L GM Turnbull and F/L GE Hervey were appointed to the Committee on 10 July 1922, replacing F/L MacRae and F/O Gorman)

British Columbia

Original Appointments 23 June 1920	Appointed 1 April 1921
Mr. Henry Bell-Irving, Chairman	Mr. Henry Bell-Irving
Mr. EV Peters, Vice-Chairman	Mr. EV Peters
Mr. NA Yarrow	Mr. NA Yarrow
S/L RHB Ker	S/L RHB Ker
S/L AM Lester	S/L AM Lester
F/L PE Beasley	W/C JS Williams
F/L GH Stuart	F/L EC Hoy

F/L GM Dean, Secretary

Appendix C1

AIRMEN DISCHARGED FROM THE ROYAL CANADIAN AIR FORCE ON TERMINATION OF ENGAGEMENT, 31 MARCH 1924

Note: 1. The 189 airmen marked (X) were re-attested and enlisted in the Permanent R.C.A.F. on 1 April 1924. The 9 airmen marked (Z) re-enlisted later in 1924.

2. Some variations are shown in the trades reported in Air Force Weekly Orders and those given in unit Daily Routine Orders.

3. The rates of pay at 31 March 1924 were: WO - $4.10; FS - #3.60; Sgt. - $2.90; Cpl. - $2.50; 1/AM - $2.30; and 2/AM - $2.00.

Number	Rank	Name	Trade	
		R.C.A.F. Headquarters		
1.	WO1	H. H. Atkinson	Clerk General	(X)
1707.	A/WO	D. W. Johnston	Storekeeper	(X)
2.	FS	F. Aldridge	Clerk General	(X)
29.	Sgt.	W. G. Thompson	Clerk Steno.	(X)
7.	A/Sgt.	F. N. Brooks	Clerk General	(X)
1568.	A/Sgt.	G. F. Evans	Draughtsman	(Z)
25.	Cpl.	A. C. Duggan	Clerk Steno.	(X)
26.	Cpl.	J. Greenhalgh	Draughtsman	(X)
1506.	A/Cpl.	J.S. Beaton	Clerk General	
5.	1/AM	J. H. Dobson	Clerk Steno.	(X)
1507.	1/AM	J. E. O'Donnell	Clerk General	(X)
1558.	2/AM	J. C. Goldie	Clerk General	(X)
1550.	2/AM	C. V. Maxwell	Clerk General	(X)
1552.	2/AM	R. P. Williamson	Clerk General	(X)
1705.	2/AM	A. L. Graham	Clerk Stores	(X)
1508.	2/AM	C. H. Cotton	Draughtsman	(X)
		Photographic Section		
472.	A/Sgt.	J. H. Kennedy	Disciplinarian	
997.	Cpl.	A. J. LeSueur	Photographer	
41.	A/Cpl.	J. E. Dorion	Photographer	(X)

Number	Rank	Name	Trade	
36.	1/AM	A. M. Archdeacon	Photographer	(X)
1569.	1/AM	A. E. E. Church	Photographer	(X)
1549.	1/AM	J. E. W. Drolet	Clerk General	(X)
1553.	2/AM	J. W. Crosbie	Photographer	
9.	2/AM	L. MacDonald	Photographer	(X)
8.	2/AM	J. Ware	Photographer	(X)
		R.C.A.F. Station Vancouver		
16.	A/FS	R. W. Coupland	Rigger Aero	(X)
11.	A/Sgt.	F. R. Corp	Rigger Aero	(X)
18.	A/Sgt.	G. Gorrill	Fitter A.E.	(X)
242.	Sgt.	N. C. Terry	Fitter A.E.	(X)
1246.	Cpl.	H. O. Bell	Rigger Aero	(X)
47.	A/Cpl.	J. MacAslan	Clerk Steno.	(X)
15.	1/AM	A. Dickie	Rigger Aero	(X)
1554.	1/AM	J. R. Johnson	Rigger Aero	(X)
209.	1/AM	W. A. Wilson	Rigger Aero	(X)
1556.	1/AM	F. Young	Rigger Aero	(X)
1512.	1/AM	H. E. Davenport	Fitter A.E.	(X)
1547.	1/AM	W. Gear	Fitter A.E.	(X)
1521.	1/AM	W. G. Partridge	Fitter A.E.	(X)
1479.	1/AM	R. Pearce	Fitter A.E.	
1532.	1/AM	F. M. Clark	Clerk Steno.	(X)
1504.	1/AM	E. C. Tennant	Clerk Stores	(X)
1559.	2/AM	A. S. Coburn	Rigger Aero	(X)
1537.	2/AM	A.D. Campbell	Fitter A.E.	(X)
1531.	2/AM	E. Huggard	Driver M.T.	(X)
1566.	2/AM	W. S. Tall	Fitter A.E.	(X)
271.	2/AM	J. F. Edwards	Labourer	
		R.C.A.F. Station High River		
27.	A/FS	A. Rabnett	Rigger Aero	(X)

Number	Rank	Name	Trade	
57.	Sgt.	W. J. McGrandle	Fitter A.E.	(X)
66.	Sgt.	T. Hayes	Rigger Aero	(X)
1313.	A/Sgt.	E. Aldersley	Clerk Steno.	(Z)
603.	A/Cpl.	W. E. Godfrey	Rigger Aero	(X)
1551.	A/Cpl.	F. Little	Fitter A.E.	(X)
38.	A/Cpl.	W. M. Pearce	Fitter A.E.	(X)
48.	1/AM	A. Caggie	Rigger Aero	(X)
1540.	1/AM	A. Richards	Fitter A.E.	(X)
1561.	1/AM	C. H. Green	Fitter A.E.	(X)
1376.	1/AM	O. A. Peterson	Fitter A.E.	
1513.	1/AM	A. S. Robbins	Clerk Stores	(X)
1509.	1/AM	H. G. Ward	Driver M.T.	
1702.	2/AM	E. W. Davey	Rigger Aero	(X)
1701.	2/AM	A. H. McCurdy	Rigger Aero	(X)
999.	2/AM	A. H. Warner	Fitter A.E.	(X)
1571.	2/AM	R. M. Brazil	Clerk Steno.	(X)
1516.	2/AM	P. E. Richards	Clerk Stores	(X)
1510.	2/AM	F. Harlow	Rigger Aero	(X)
1557.	2/AM	S. C. Dearaway	Fitter M.T.	(Z)
1708.	2/AM	W. E. Tompkins	Aircraft Hand	(X)
62.	2/AM	A. H. Bishop	Labourer	(X)

R.C.A.F. Station Winnipeg

31.	Sgt.	A. T. Livingstone	Rigger Aero	(X)
86.	A/Sgt.	W. Gorham	Rigger Aero	(X)
1527.	A/Sgt.	T. F. Cooper	Fitter A.E.	(X)
1542.	A/Sgt.	G. Moon	Clerk General	(X)
1505.	A/Cpl.	T. H. Cressy	Fitter A.E.	(X)
23.	A/Cpl.	B. M. Aronson	Clerk General	(X)
1296.	1/AM	D. Ceifets	Rigger	(X)
1588.	1/AM	H. T. Dewhurst	Rigger Aero	
1530.	1/AM	A. F. Hamilton	Rigger Aero	

Number	Rank	Name	Trade	
1529.	1/AM	G. R. Horton	Rigger Aero	(X)
1544.	1/AM	J. N. McAskill	Rigger Aero	(X)
10.	1/AM	H. C. Semple	Rigger Aero	(X)
1535.	1/AM	J. Maskell	Fitter A.E.	(X)
1548.	1/AM	A. J. Milne	Fitter A.E.	(X)
1541.	1/AM	C. Sheldon	Clerk Steno.	(X)
1539.	1/AM	W. P. Mealing	Driver	(X)
1534.	1/AM	F. W. Long	Cook	(X)
174.	1/AM	H. F. Stone	Mess Labourer	(X)
1582.	2/AM	R. H. Philbrow	Rigger Aero	(X)
1593.	2/AM	A. C. Powell	Rigger	(X)
1577.	2/AM	G. W. Cholerton	Fitter A.E.	
1583.	2/AM	G. H. Coppen	Fitter A.E.	(X)
1587.	2/AM	R. Marshall	Fitter A.E.	(X)
1590.	2/AM	H. I. Meech	Fitter A.E.	(X)
1584.	2/AM	L. T. Palmer	Fitter A.E.	(X)
1581.	2/AM	J. Dasey	Clerk Steno.	(X)
1576.	2/AM	H. Passey	Clerk Stores	(X)
1578.	2/AM	H. Marsh	Machinist	(X)
1563.	2/AM	R. E. Cooper	Mess Labourer	
1545.	2/AM	R. W. Finch	Mess Labourer	(X)
1591.	2/AM	L. J. Davies	Labourer	(X)
1580.	2/AM	F. J. Ewart	Labourer	(X)
1543.	2/AM	A. E. Hopkins	Labourer	(X)
1579.	2/AM	S. S. Joscelyn	Labourer	(X)
1589.	2/AM	F. A. Minton	Labourer	(X)
1575.	2/AM	W. A. O'Malley	Labourer	(X)
1592.	2/AM	W. H. Lane	Watchman	(X)

R.C.A.F. Station Ottawa

98.	FS	R. G. Ford	Fitter A.E.	(X)
70.	A/FS	S. McConnell	Fitter A.E.	(X)

Number	Rank	Name	Trade	
1460.	A/FS	H. J. Smith	Clerk Stores	(X)
33.	A/Sgt.	W. Staveley	Rigger and Discip.	(X)
1417.	A/Sgt.	W. S. Haynes	Clerk Stores	(X)
32.	A/Cpl.	J. H. Palmer	Rigger Aero	(X)
69.	A/Cpl.	J. H. Tyrrel	Fitter A.E.	(X)
1500.	A/Cpl.	J. E. Talbot	Clerk Stores	(X)
1501.	1/AM	F. A. Hutchings	Rigger Aero	(X)
1514.	1/AM	A. J. Horner	Fitter A.E.	(X)
40.	1/AM	H. H. Rolt	Clerk Stores	(X)
22.	1/AM	L. A. Nettleton	Clerk Stores	
6.	1/AM	D. E. MacKell	Clerk Steno.	(X)
1150.	1/AM	E. Moodie	Clerk General	(X)
1071.	1/AM	L. J. Chandler	Storeman	(X)
1086.	1/AM	R. J. Shaw	Driver M.T.	(X)
1706.	2/AM	J. P. McDonald	Rigger Aero	(X)
1519.	2/AM	W. C. Boone	Fitter A.E.	(X)
1520.	2/AM	A. Foubert	Fitter A.E.	(X)
573.	2/AM	G. LaGrave	Fitter A.E.	(X)
1700.	2/AM	R. M. Patterson	Fitter A.E.	(X)
1517.	2/AM	K. M. Smyth	Fitter A.E.	(X)
1570.	2/AM	A. T. Hirsch	Labourer	(X)
1572.	2/AM	W. Ireland	Labourer	(X)
		<u>Roberval</u>		
1562.	2/AM	E. Bonneau	Driver M.T.	
		<u>R.C.A.F. Station Dartmouth</u>		
80.	FS	M. Graham	Fitter A.E.	(X)
81.	Sgt.	M. L. Colp	Rigger Aero	(X)
85.	A/Cpl.	H. A. Dickson	Clerk Stores	(X)
84.	A/Cpl.	C. H. Nesbitt	Clerk Stores	(Z)
83.	1/AM	J. E. Hertle	Carpenter (Boat Builder)	(X)

Number	Rank	Name	Trade	
1511.	1/AM	F. Lund	Fitter A.E.	(Z)
76.	1/AM	F. G. Rout	Fitter M.T.	
1703.	2/AM	A. E. Anderson	Fitter A.E.	(X)
1567.	2/AM	B. E. Ritcey	Cook	(X)
1525.	2/AM	T. J. Sullivan	Labourer	(X)
1533.	2/AM	D. Conrad	Labourer	
1560.	2/AM	E. S. Conrad	Labourer	
1574.	2/AM	A. M. Horne	Labourer	

R.C.A.F. Station Camp Borden

946.	FS	W. J. W. Gregson	Rigger Aero	(X)
1126.	FS	J. Wibberley	Rigger Aero	(X)
963.	FS	J. Boyd	Fitter A.E.	(X)
122.	FS	J. McLaughlan	Fitter A.E.	(X)
968.	FS	L. Taylor	Fitter A.E.	(X)
1272.	FS	D. Lusk	Machinist	(X)
201.	A/FS	W. R. Allan	Clerk Pay	(X)
448.	A/FS	V. E. Raymond	Clerk General	(X)
301.	A/FS	H. S. Alguire	Rigger Aero	(X)
351.	Sgt.	R. J. Beaumont	Rigger Aero	(X)
962.	Sgt.	D. Black	Fitter A.E.	(X)
1163.	A/Sgt.	C. K. Flewelling	Rigger Aero	(X)
1315.	A/Sgt.	L. Perry	Fitter M.T.	(X)
1116.	A/Sgt.	F. Hems	Machinist	(X)
780.	Cpl.	F. Duggan	Clerk General	(X)
824.	Cpl.	G. E. Byron	Fabric Worker	(X)
194.	A/Cpl.	G. L. Hobson	Rigger Aero	(X)
1276.	A/Cpl.	W. Ramsden	Rigger Aero	(X)
563.	A/Cpl.	B. I. Barton	Fitter A.E.	(X)
1081.	A/Cpl.	R. R. Carrington	Fitter M.T.	(X)
268.	A/Cpl.	W. F. McCauley	Rigger	(X)

Number	Rank	Name	Trade	
1492.	A/Cpl.	R. H. Cross	Clerk General	(X)
1472.	A/Cpl.	F. B. Fulford	Clerk Steno.	(X)
527.	A/Cpl.	R. G. Burton	Clerk Stores	(X)
1366.	A/Cpl.	H. E. Matthews	Cook	(X)
1626.	A/Cpl.	J. Godfrey	Labourer	(X)
1353.	1/AM	W. Dye	Rigger Aero	(X)
1380.	1/AM	A. Anderson	Fitter A.E.	(X)
20.	1/AM	J. H. Lapointe	Fitter A.E.	(X)
1627.	1/AM	R. C. Bigland	Clerk General	(X)
1609.	1/AM	E. G. Fox	Clerk General	(X)
1480.	1/AM	J. E. Pinch	Clerk General	(X)
1457.	1/AM	R. H. Robillard	Clerk General	(X)
1634.	1/AM	R. H. Underwood	Clerk General	(X)
1650.	1/AM	R. E. McPartlin	Clerk Steno.	(X)
1630.	1/AM	J. Newton	Clerk Steno.	(X)
1490.	1/AM	W. G. Comrie	Clerk Stores	(X)
1602.	1/AM	S. H. Edwards	Clerk Stores	(X)
1669.	1/AM	H. H. McArthur	Clerk Canteen	(X)
1641.	1/AM	W. G. Attewell	Driver M.T.	(X)
4.	1/AM	J. A. Richardson	Armourer	(X)
1611.	1/AM	O. W. Chapman	Blacksmith	(X)
1089.	1/AM	A. Clarke	Labourer	(X)
1461.	1/AM	J. Smith	Labourer	(X)
1469.	2/AM	J. McLeod	Rigger Aero	(X)
1617.	2/AM	A. Bradley	Fitter A.E.	(X)
1632.	2/AM	M. Currell	Fitter A.E.	(X)
1646.	2/AM	A. Holdsworth	Fitter A.E.	(X)
1665.	2/AM	F. W. Kirkcaldy	Fitter A.E.	(X)
1616.	2/AM	N. C. McArthur	Fitter A.E.	(X)
1661.	2/AM	H. McNemamin	Fitter A.E.	(X)
1622.	2/AM	G. C. Ramshaw	Fitter A.E.	(X)

Number	Rank	Name	Trade	
1615.	2/AM	A. B. R. Webb	Fitter A.E.	(X)
1629.	2/AM	W. Baylis	Clerk General	(X)
1644.	2/AM	F. J. Going	Clerk General	(X)
1639.	2/AM	R. F. Chisholm	Clerk Steno.	(X)
1673.	2/AM	W. H. Burr	Bugler	(X)
1585.	2/AM	S. A. Redman	Tailor	(X)
1645.	2/AM	A. E. Denning	Labourer	(X)
1664.	2/AM	J. F. Armitt	Labourer	(X)
1671.	2/AM	A. Burley	Labourer	(X)
1610.	2/AM	A. S. Couch	Labourer	(X)
1614.	2/AM	R. Elphick	Labourer	(X)
1666.	2/AM	A. D. Harriott	Labourer	(X)
1621.	2/AM	M. Hunt	Labourer	(X)
1606.	2/AM	G. V. Miscampbell	Labourer	(X)
1659.	2/AM	F. M. Skelly	Labourer	(X)
1623.	2/AM	E. C. Sullivan	Labourer	(X)

(The 68 airmen listed above, who were discharged "on termination of engagement", might be regarded as the "permanent" staff at R.C.A.F. Station Camp Borden; they were all immediately re-enlisted in the Permanent R.C.A.F. on 1 April 1924. The 52 airmen listed below were struck off strength at Camp Borden "on completion of tour of duty"; only one was re-enlisted in the Permanent R.C.A.F. on 1 April 1924, and four others re-enlisted later in that year).

R.C.A.F. Station Camp Borden

Struck off strength on completion of tour of duty, 31 March 1924

Number	Rank	Name	Trade	
132.	Sgt.	H. H. Dunn	Cook	
161.	A/Sgt.	F. C. Dawkins	Clerk Stores	(Z)
1235.	A/Cpl.	A. J. Cook	Rigger Aero	(Z)
1034.	A/Cpl.	H. Bryden	Instrument Repairer	
1233.	A/Cpl.	R. L. Martinson	Armourer	
1142.	A/Cpl.	D. Cameron	Tinsmith	(Z)
302.	A/Cpl.	L. A. Garrard	Telephone Operator	(X)
1155.	A/Cpl.	T. A. Corlett	Tailor	
1453.	A/Cpl.	W. T. Osborne	Bugler	
1169.	A/Cpl.	E. Conway	Labourer	
1189.	1/AM	L. C. Ellison	Rigger Aero	
395.	1/AM	G. Singleton	Rigger Aero	
1600.	1/AM	R. Lowndes	Fitter A.E.	
1636.	1/AM	F. I. Lorenson	Clerk Steno.	
1628.	1/AM	E. M. Rich	Clerk General	
1476.	1/AM	W. J. Campion	Clerk Steno.	
1486.	1/AM	R. G. Green	Clerk Stores	
137.	1/AM	J. A. Bates	Armourer	
1262.	1/AM	R. C. Kidner	Fabric Worker	
1635.	2/AM	A. J. Jacquet	Rigger Aero	
1647.	2/AM	C. B. Carruthers	Fitter A.E.	
1292.	2/AM	J. A. Cochrane	Fitter A.E.	
1625.	2/AM	E. R. Cockburn	Fitter A.E.	
1654.	2/AM	G. Eynon	Fitter A.E.	
1619.	2/AM	W. Long	Fitter A.E.	
1663.	2/AM	H. Lowndes	Fitter A.E.	
1612.	2/AM	S. M. Power	Fitter A.E.	
1085.	2/AM	T. W. Mutter	Clerk General	
1651.	2/AM	W. Haynes	Clerk Stores	

Number	Rank	Name	Trade
950.	2/AM	H. Braney	Clerk Canteen (Z)
1640.	2/AM	V. J. Sullivan	Machinist
1653.	2/AM	R. McNamara	Sheet Metal Worker
1637.	2/AM	G. A. Hood	Tinsmith
1655.	2/AM	R. Eynon	Carpenter
1657.	2/AM	D. T. King	Carpenter
1652.	2/AM	D. McNamara	Carpenter
1464.	2/AM	D. N. Kraushaar	Storeman
1668.	2/AM	A. Bertrand	Labourer
1224.	2/AM	W. Dale	Labourer
1643.	2/AM	T. Douglas	Labourer
1670.	2/AM	C. Dredge	Labourer
1608.	2/AM	E. Flowers	Labourer
1360.	2/AM	C. Fournier	Labourer
1667.	2/AM	W. H. Harriott	Labourer
1620.	2/AM	A. Hobbs	Labourer
1638.	2/AM	F. J. LaTrobe	Labourer
1631.	2/AM	J. A. Morrison	Labourer
1402.	2/AM	T. Penn	Labourer
1660.	2/AM	E. Sandiland	Labourer
1642	2/AM	J. H. Cook	Labourer
1493	2/AM	H. H. Anderson	Labourer
1607	2/AM	D. MacDonald	Labourer

Summary by Rank

Station	WO	FS	Sgt.	Cpl.	1/AM	2/AM	Total
AFHQ	2	1	3	3	2	5	16
Phot. Sec			1	2	3	3	9
Vancouver		1	3	2	10	5	21
High River		1	3	3	6	9	22
Winnipeg			4	2	12	19	37

Summary by Rank (cont'd)

Station	WO	FS	Sgt.	Cpl.	1/AM	2/AM	Total
Ottawa		3	2	3	8	8	24
Roberval						1	1
Dartmouth		1	1	2	3	6	13
Camp Borden)		9	5	12	18	24	68
)			2	8	9	33	52
Totals	2	16	24	37	71	113	263

Summary by Trade

Trade	H.Q.	Phot	Van.	H.R.	Wpeg	Ott.	Rob.	Dart	C.B.	Total
Armourer									3	3
Blacksmith									1	1
Bugler									2	2
Carpenter								1[a]	3	4
Clerk General	8	1			2	1			13[b]	25
Clerk Steno.	3		2	2	2	1			6	16
Clerk Stores	1		1	2	1	5		2	6	18
Cook					1			1	2	4
Disciplinarian		1								1
Draughtsman	3									3
Driver M.T.			1	1	1	1	1		1	6
Fabric Worker									2	2
Fitter A.E.			8	7	9	9		3	23	59
Fitter M.T.				1				1	2	4
Inst. Repairer									1	1
Labourer			1	2[c]	6	2		4	29	44
Machinist					1				3	4
Mess Labourer					3				2[d]	5
Photographer		7								7
Rigger Aero			8	7	10	4[e]		1	14	44
Storeman	1[f]					1			1	3
Tailor									2	2
Tel. Operator									1	1
Tinsmith									3[g]	3
Watchman					1					1
Totals	16	9	21	22	37	24	1	13	120	263

Notes:
(a) - Carpenter (Boat Builder)
(b) - includes one Clerk Pay
(c) - includes one Aircraft Hand
(d) - two Clerks Canteen
(e) - includes one Rigger & Disciplinarian
(f) - Storekeeper
(g) - includes one Sheet Metal Worker

Appendix C2

NOMINAL ROLL OF OFFICERS APPOINTED TO THE ROYAL CANADIAN AIR FORCE

ON 1 APRIL 1924

Abbreviations

Ranks: P/O - Pilot Officer; F/O - Flying Officer; F/L - Flight Lieutenant; S/L - Squadron Leader; W/C - Wing Commander.
b - brevet rank; t - temporary rank.
P - Photographic; Q - Quartermaster; S - Supply; T - Technical.

Units: AFHQ - Air Force Headquarters Phot - Photographic Section
Tech - Technical Depot
C.B. - RCAF Station Camp Borden Dart - RCAF Station Dartmouth
H.R. - RCAF Station High River Ott. - RCAF Station Ottawa
Van. - RCAF Station Vancouver Wpeg - RCAF Station Winnipeg

No.	Name	Initial Rank	Unit	Final Rank	Remarks
		Permanent			
C40.	Anderson, Norman Russell	S/L	C.B.	A/V/M	retired 11/12/45 died 31/ 7/48
C36.	Apps, Gordon Frank Mason	F/O	C.B.	F/L	killed 24/10/31
C59.	Ashton, Arthur James	P/O (S)	Tech	A/C	retired 21/ 5/45
C12.	Baker, William Edward	P/O (S)	AFHQ	G/C	retired 20/12/44 died 8/ 2/50
C 2.	Barker, William George	W/C	AFHQ	W/C	resigned 24/8/26 killed 12/3/30
C45.	Blackmore, George John	F/L (Q)	C.B.	F/L	resigned 28/9/26
C39.	Breadner, Lloyd Samuel	S/L (t/W/C)	C.B.	A/C/M	retired 25/11/45 died 14/ 3/52
C42.	Brookes, George Eric	F/L	C.B.	A/V/M	retired 22/11/44
C37.	Cairns, David James Robertson	P/O (P)	Wpeg	W/C	retired 23/ 9/45
C24.	Carter, Albert	F/O	H.R.	W/C	retired 6/ 8/43 died 8/11/56
C32.	Charron, Leo Rosario	F/O	Wpeg	F/L	died 1/12/32
C289.	Coghill, Frank Street	F/O	C.B.	F/L W/C	to Reserve 31/5/35 Called up 3/9/39 retired 4/12/44
C46.	Collis, Reginald	F/O (t/F/L)	C.B.	A/C	retired 29/10/44
C 9.	Cowley, Arthur Thomas Noel	F/L	AFHQ	A/V/M	retired 12/ 7/45
C65.	Croil, George Mitchell	S/L	AFHQ	A/M	retired 2/ 7/44 died 8/ 4/59

No.	Name	Initial Rank	Unit	Final Rank	Remarks
C58.	Crossfield, Francis John	F/O (S)	C.B.	W/C	died 1/ 6/40
C23.	Cuffe, Albert Abraham Lawson	S/L	H.R.	A/V/M	retired 1/ 7/44
C50.	deNiverville, Joseph Lionel Elphege Albert	F/O	C.B.	A/V/M	retired 11/ 2/46
C29.	Dickins, Clennell Haggerston	F/O	H.R.	F/O	resigned 30/4/27
C20.	Duncan, Clarence James	P/O (P)	Van.	G/C	retired 14/ 9/44
C30.	Edwards, Harold	F/L	Wpeg	A/M	retired 29/ 9/44 died 23/ 2/52
C11.	Ferrier, Alan	F/O (T)	AFHQ	A/V/M	retired 23/ 3/45
C25.	Fullerton, Elmer Garfield	F/O	H.R.	G/C	retired 9/ 8/46
C21.	Gillespie, Frederick Bedford	P/O (S)	Van.	F/O	relinq. 31/ 5/26
C66.	Godfrey, Albert Earl	S/L	Van.	A/V/M	retired 8/ 6/44
C13.	Gordon, James Lindsay	W/C	AFHQ	A/V/M	retired 31/ 1/40 died 4/ 3/40
C61.	Grandy, Roy Stanley	F/L			apptmt. cancelled reapptd. 1/ 1/25
				G/C	retired 18/ 6/46
C44.	Grant, Reginald John	F/L (T)	C.B.	A/C	retired 3/ 9/44 died 8/ 2/59
C34.	Guthrie, Kenneth McGregor	F/O	Wpeg	A/V/M	retired 19/10/49
C53.	Harding, David Allan	F/O	C.B.	G/C	retired 7/ 8/46
C413.	Harrop, Benjamin Nelson	F/O (b/F/L)	Wpeg	F/L	to Reserve 13/5/29 reapptd.
				W/C	retired 1/ 5/44
C56.	Heakes, Francis Vernon	F/O	C.B.	A/V/M	retired 13/ 8/46
C417.	Hector, James Herbert	P/O (S)	Ott.	F/O	resigned 25/10/26 died 13/6/58
C43.	Hewson, Henry Willis	F/O (b/F/L)	C.B.	F/L	killed 26/ 7/32
C48.	Higgins, Frank Chipman	F/O (b/F/L)	AFHQ	G/C	retired 9/ 3/43
C 6.	Hobbs, Basil Deacon	S/L	Wpeg	S/L	resigned 1/ 9/25 reapptd. 18/ 6/40
				G/C	retired 7/ 8/45
C33.	Howsam, George Roberts	F/O	Wpeg	A/V/M	retired 5/ 2/46
C19.	Hull, Allan Herbert	F/O	Van.	A/C	retired 10/ 8/44

No.	Name	Initial Rank	Unit	Final Rank	Remarks
C14.	Hume, Duncan Clive MacKenzie	S/L (T)	Tech	G/C	retired 26/10/44
C 4.	Johnson, George Owen	S/L	AFHQ	A/M	retired 17/ 2/47
C 5.	Kenny, Walter Robert	S/L	AFHQ	A/V/M	retired 30/10/42 died 11/ 4/44
C 7.	Lawrence, Thomas Albert	F/O	C.B.	A/V/M	retired 4/ 4/47
C64.	Leitch, Alfred Alexander	F/L	H.R.	S/L	retired 13/ 9/38 died 3/ 1/55
C18.	MacLeod, Earl Leslie	F/O (t/F/L)	Van.	A/C	retired 1/ 9/44
C49.	Mawdesley, Frederick Joseph	F/O (b/F/L)	AFHQ	G/C	retired 6/ 7/45
C60.	McEwen, Clifford	F/L	Ott.	A/V/M	retired 27/ 4/46
C28.	Mercer, George Albert	F/O	H.R.	G/C	retired 13/ 7/43
C57.	Morfee, Arthur Lawrence	F/O (P)	C.B.	A/V/M	retired 28/ 3/49
C38.	Mossop, Neron Frederick	P/O (S)	Wpeg	A/C	retired 10/ 3/46
C22.	Owen, Edward Rosser	F/O (P)	Phot	G/C	retired 18/10/44
C 1.	Scott, James Stanley	W/C	AFHQ	G/C A/C	resigned 15/5/28 reapptd. 22/6/40 retired 26/2/45
C27.	Sharpe, Norman Edgar	P/O (S)	H.R.	G/C	retired 6/ 3/45
C 3.	Stedman, Ernest Walter	W/C (T)	AFHQ	A/V/M	retired 27/ 4/46 died 27/ 3/57
C31.	Stevenson, Leigh Forbes	F/L	Wpeg	A/V/M	retired 9/ 7/45
C10.	Tackaberry, Stanley Gibson	F/L(S)	AFHQ	A/C	retired 20/ 7/46
C707.	Trim, George Knopp	F/O	C.B.	F/L	resigned 28/5/27
C17.	Tudhope, John Henry	F/L (b/S/L)	Dart	S/L	retired 7/ 6/38 died 11/10/56
C 8.	Wait, George Enoch	F/L	AFHQ	A/V/M	retired 12/10/47
C26.	Walker, Cyril Charles	P/O (P)	Phot	G/C	died 8/ 5/41
C41.	Walsh, George Victor	F/L	C.B.	A/V/M	retired 5/10/46
C51.	White, Joseph Leonard Marie	F/O (b/F/L)	Ott.	F/L	killed 24/ 2/25
C16.	Wylie, Alexander Hugh	F/O (S)	C.B.	G/C	retired 24/ 7/43

Non-Permanent

C77.	Johnson, Allan Lawrence	F/L	Tech	A/C	retired 5/12/46 died 17/12/49

No.	Name	Initial Rank	Unit	Final Rank	Remarks
C68.	Shearer, Ambrose Bernice	S/L	C.B.	A/V/M	retired 1/10/44 died $/ 9/52
	Snow, Arthur Courtney	F/L	AFHQ	F/L	S.O.S. 24/ 5/24
C677.	Stewart, Hugh Ronald	F/L	AFHQ	F/L	to Reserve 25/6/24 called up 3/9/39
				G/C	retired 15/1/46

(Note: Johnson, Shearer and Stewart were attached to the Permanent RCAF on 1 April 1924; Shearer was subsequently appointed to the Permanent on 1 April 1925 and Johnson on 1 October 1925).

A/C/M	- 1	)
A/M	- 3	)
A/V/M	-20	)
A/C	- 9	) Final Rank Attained by the Original
G/C	-15	) Officers of the Royal Canadian Air
W/C	- 6	) Force
S/L	- 2	)
F/L	- 7	)
F/O	- 3	)
	66	)

Appendix C3

NOMINAL ROLL OF AIRMEN ATTESTED AND ENLISTED IN THE ROYAL CANADIAN AIR FORCE

ON 1 APRIL 1924

Note: With the exception of J. A. Briggs, F. A. Coulson, R. P. Hennessey, H. Miscampbell, and G. S. Ramsay, all the airmen listed below were serving with the Royal Canadian Air Force on 31 March 1924.

No.	Name	Rank	Unit	Rank and Date of Release
2.	Aldridge, Frank	FS	AFHQ	S/L commn. 15/12/39 (C1550) retired 8/ 7/44
1209.	Alguire, Howard Stanley	Sgt	C.B.	FS discharged 31/ 3/30
1205.	Allan, William Richardson	Sgt.	C.B.	WO2 discharged 18/ 4/36
1228.	Anderson, Alexander	AC1	C.B.	FS killed, fly. acc., 21/3/32
1007.	Anderson, Arthur Edward	AC2	Dart	Sgt discharged 31/ 3/32
26.	Archdeacon, Arthur Montagu	LAC	Phot	S/L commn. 27/ 2/42 (C10173) retired 30/ 9/47
1219.	Armitt, John Fleming	AC2	C.B.	AC2 discharged 13/10/24 (deserter)
609.	Aronson, Bernard Mortimer	Cpl	Wpeg	W/C commn. 1/ 1/26 (C78) retired 23/10/44
1.	Atkinson, Harold Hartley	WO1	AFHQ	G/C commn. 1/ 4/39 (C966) retired 18/ 5/46
1215.	Attewell, William Gordon	AC1	C.B.	W/C commn. 3/11/41 (C8185) retired 19/ 3/47
1242.	Barton, Bernard Irwin	Cpl	C.B.	S/L commn. 15/ 7/40 (C2276) retired 13/ 1/47
1266.	Baylis, Wilfred	AC2	C.B.	AC2 discharged 30/ 6/24
1245.	Beaumont, Robin James	Sgt	C.B.	W/C commn. 1/ 4/38 (C879) retired 30/ 5/46
205.	Bell, Henry Obediah	Cpl	Van.	Cpl discharged 15/ 5/ 26
1253.	Bigland, Ronald Cecil	AC1	C.B.	LAC discharged 19/11/26 (deserter)
418.	Bishop, Albert Henry	AC1	H.R.	Cpl discharged 28/ 8/39
1244.	Black, Duncan	Sgt	C.B.	S/L commn. 15/ 5/40 (C1983) retired 10/ 1/46
820.	Boone, W.C.	AC2	Ott.	AC2 discharged 31/ 3/27
1236.	Boyd, John Brims	FS	C.B.	G/C commn. 10/ 4/30 (C122) retired 1/ 7/45

No.	Name	Rank	Unit	Rank and Date of Release
1248.	Bradley, Arthur	AC2	C.B.	Cpl discharged 31/ 3/30
414.	Brazil, Robert Maxwell	AC2	H.R.	commn. 30/ 8/41 (C6689) F/L retired 4/ 2/44
1269.	Briggs, Joseph Athorp	AC2	C.B.	AC2 discharged 24/9/24
7.	Brooks, Frederick Norman	Sgt	AFHQ	WO1 discharged 27/ 3/46
1229.	Burley, Arthur	AC2	C.B.	WO2 discharged 18/ 8/26 re-enlisted 1934 ? WO2 released 18/ 6/56
1224.	Burr, William Henry	AC2	C.B.	WO1 discharged 31/ 7/43
1232.	Burton, Rupert George	Cpl	C.B.	commn. 1/ 8/41 (C6300) F/L retired 31/8/44 died 12/11/48
1212.	Byron, George Edward Patrick	Cpl	C.B.	FS discharged 14/10/40
408.	Caggie, Andrew	LAC	H.R.	Sgt discharged 27/ 3/29
218.	Campbell, A.D.	AC2	Van.	discharged 15/ 5/26
1239.	Carrington, R.R.	LAC	C.B.	discharged 31/ 3/27
636.	Ceifets, David	Cpl	Wpeg	WO1 discharged 29/ 9/46
813.	Chandler, Leo Pringle	LAC	Tech	FS discharged 29/ 4/33
1259.	Chapman, Owen Wesley	LAC	C.B.	discharged 31/ 3/27 re-enlisted 13/11/40 WO1 discharged 9/ 5/46
1256.	Chisholm, Robert Findlay	AC1	C.B.	Sgt discharged 31/ 3/27 re-enlisted 2/10/42 (comm) F/L retired 14/12/45 (C14582)
27.	Church, Alfred Earnest Edward	LAC	Phot	Cpl discharged 21/ 7/24
217.	Clark, Fitz Middleton	LAC	Van.	LAC discharged 31/ 5/24 (x) (5002 in Non-Permanent)
1247.	Clarke, Allan	LAC	C.B.	LAC discharged 12/ 5/37
212.	Coburn, Arthur Stanley	AC1	Van.	LAC discharged 31/ 3/27
1002.	Colp, Maynard Leonce	Sgt.	Dart	commn. 1/ 3/39 (C960) G/C retired 5/ 2/45
1249.	Comrie, William Glen	AC1	C.B.	WO1 discharged 17/ 9/46

(x) disch. Perm. 30/4/24; re-enl. Non-Perm (No. 5002) 1/5/24; disch. 31/5/24.

No.	Name	Rank	Unit	Rank and Date of Release
612.	Cooper, Thomas Frederick	Sgt	Wpeg	commn. 15/ 5/41 (C5202) W/C retired 28/ 7/46 ◘
622.	Coppen, George Horace	AC2	Wpeg	AC2 discharged 20/ 9/24
202.	Corp, Frank Robert	Sgt	Van.	Sgt discharged 15/ 5/26
10.	Cotton, Charles Henry	AC1	AFHQ	Sgt discharged 31/1/36 commn. 6/10/39 (C1149) G/C retired 6/ 1/58 (19942)
1255.	Couch, Albert Sydney	AC1	C.B.	LAC discharged 5/ 1/39
1270.	Coulson, Frederick Albert	AC2	C.B.	AC2 discharged 9/ 6/25
201.	Coupland, Robert William	FS	Van.	FS discharged 6/10/28
613.	Cressy, Theodore Henry	Cpl	Wpeg	Sgt discharged 11/ 5/26
1250.	Cross, Ronald Horace	Cpl	C.B.	commn. 16/ 7/24 (C47) F/O killed, fly. acc., 24/2/25
1257.	Currell, Maynard	AC2	C.B.	AC2 discharged 16/ 7/25
603.	Dasey, J.	AC2	Wpeg	
210.	Davenport, H.E.	Cpl	Van.	Cpl discharged 1/ 5/26
411.	Davey, E.W.	LAC	H.R.	Cpl discharged 31/ 3/27
630.	Davies, L.J.	AC2	Wpeg	LAC discharged 11/ 8/26
1267.	Denning, A.E.	AC2	C.B.	AC2 discharged 30/ 6/24
207.	Dickie, A.	Cpl	Van.	discharged 7/ 5/26
1003.	Dickson, Harold Archibald Wilfred	Cpl	Dart	commn. 1/ 1/26 (C79) G/C retired 25/ 4/46
8.	Dobson, J.H.	LAC	AFHQ	discharged 31/ 3/27
25.	Dorion, J.E.	Sgt	Phot	FS discharged 31/ 3/27
29.	Drolet, Joseph Edward Walker	LAC	Phot	commn. 15/ 7/40 (C2269) F/O retired 14/4/45
3.	Duggan, Arthur Cornelius	Cpl	AFHQ	commn. 16/ 2/41 (C4185) F/L retired 22/4/47
1210.	Duggan, J.F.	Cpl	C.B.	discharged 30/ 9/40
1207.	Dye, William	AC1	C.B.	Sgt discharged 23/ 5/37

◘ Some later service (with Air Cadets?) - final number 300054.

No.	Name	Rank	Unit	Rank	and Date of Release
1251.	Edwards, S.H.	AC1	C.B.		discharged 8/ 6/31 commn. 16/ 1/45 (C93557) released
1268.	Elphick, R.	AC2	C.B.		discharged 31/ 3/27
624.	Ewart, Frederick James	AC2	Wpeg	G/C	commn. 1/ 2/39 (C949) retired 30/ 3/47
627.	Finch, R.W.	AC2	Wpeg		discharged 31/ 7/26
1238.	Flewelling, Cecil Karl	Sgt	C.B.	S/L	commn. 15/10/40 (C2901) retired 25/5/45
802.	Ford, Roland George	FS	Ott.	W/C	commn. 10/ 4/30 (C124) retired 17/ 8/43
823.	Foubert, A.	AC2	Ott.	AC2	discharged 20/10/24
1260.	Fox, E.G.	AC1	C.B.	LAC	discharged 31/ 3/27
1204.	Fulford, Francis Burton	Cpl	C.B.	S/L	commn. 15/12/40 (C3324) retired 6/ 9/44
1275.	Garrard, L.A.	Cpl	C.B.	Sgt	discharged 25/ 2/39
211.	Gear, W.	LAC	Van.		discharged 26/ 5/44
1264.	Godfrey, J.	Cpl	C.B.	Sgt	discharged 17/ 7/38
407.	Godfrey, W.E.	LAC	H.R.		discharged 20/ 6/25
1254.	Going, Frank John	AC2	C.B.		discharged 24/ 9/46
5.	Goldie, J.C.	LAC	AFHQ	LAC	discharged 6/ 2/25
611.	Gorham, W.	FS	Wpeg		
203.	Gorrill, George	Sgt	Van.	W/C	commn. 15/10/40 (C2900) retired 27/7/46
12.	Graham, A.L.	AC1	AFHQ	Cpl	discharged 6/ 3/28
1001.	Graham, M.	FS	Dart	WO2	discharged 12/ 1/29
412.	Green, Christopher Howard	LAC	H.R.	Cpl FS	discharged 31/ 8/28 re-enlisted died at Calgary 4/ 4/41
13.	Greenhalgh, J.	Sgt	AFHQ	FS	discharged 26/ 4/38
1252.	Gregson, W.J.W.	FS	C.B.	FS	discharged 15/ 7/28
416.	Harlow, F.	AC2	H.R.		discharged 30/11/26
1222.	Harriott, A.D.	AC2	C.B.	AC1	discharged 31/ 3/26
402.	Hayes, T.	Sgt	H.R.	FS	discharged 7/ 9/36
805.	Haynes, W.S.	Sgt	Tech	Sgt	discharged 12/ 4/32

No.	Name	Rank	Unit	Rank and Date of Release
1261.	Hems, Frank	Sgt	C.B.	commn. 15/ 6/40 (C2135) W/C retired 11/1/47
635.	Hennessey, R.P.	AC2	Wpeg	discharged 31/ 1/43
1004.	Hertle, J.E.	AC1	Dart	Cpl discharged 31/ 3/27
819.	Hirsch, A.T.	AC1	Tech	AC1 discharged 30/ 6/24
1246.	Hobson, George Lionel	Cpl	C.B.	commn. 24/ 3/41 (C4616) S/L retired 23/10/46
1214.	Holdsworth, A.	AC1	C.B.	
608.	Hopkins, Arthur Ernest	AC2	Wpeg	commn. 13/11/42 (C20093) F/L retired 17/6/46
808.	Horner, A. James	Cpl	Ott.	discharged 12/ 4/24 re-enlisted, Non-Permanent 13/4/24 (#5001) commn. 15/11/39 (C1565) W/C released 12/ 9/46
619.	Horton, G.R.	AC1	Wpeg	
216.	Huggard, E.	AC2	Van.	AC2 discharged 8/10/24
1233.	Hunt, M.	AC2	C.B.	discharged 31/ 3/27
815.	Hutchings, F.A.	AC1	Ott.	LAC discharged 30/ 4/26
824.	Ireland, W.	AC2	Ott.	AC2 discharged 30/ 6/24
213.	Johnson, J.R.	AC1	Van.	discharged 22/11/44
9.	Johnston, D.W.M.	WO2	AFHQ	discharged 3/ 4/27
629.	Joscelyn, S.S.	AC2	Wpeg	LAC discharged 16/ 7/26
1258.	Kirkcaldy, Frederick William	AC2	C.B.	discharged 31/ 3/30 commn. 15/10/40 (C2909) W/C retired 1/2/55 (1258)
817.	LaGrave, G.	AC1	Ott.	AC1 discharged 26/ 1/25
632.	Lane, W.H.	AC2	Wpeg	
1235.	Lapointe, Joseph Henri Dosithee	LAC	C.B.	FS died 14/ 5/44
404.	Little, F.	Cpl	H.R.	FS discharged 16/2/29
614.	Livingstone, Amos Thomas	Sgt	Wpeg	commn. 24/ 3/41 (C4612) W/C retired 20/11/46
610.	Long, F.W.	AC1	Wpeg	AC1 discharged 30/ 6/25
1262.	Lusk, David	FS	C.B.	commn. 15/ 5/41 (C5196) W/C retired 27/ 7/45
204.	MacAslan, J.	Sgt	Van.	Sgt discharged 24/ 9/26

No.	Name	Rank	Unit	Rank and Date of Release
30.	MacDonald, Lewis (Louis)	ACl	Phot	commn. 15/ 6/40 (C2131) W/C retired 30/12/46
812.	MacKell, David Edward	LAC	Ott.	commn. 15/ 9/39 (C1113) A/C retired 22/ 7/50
631.	Marsh, Harry	AC2	Wpeg	discharged 18/ 4/25
625.	Marshall, Robert	AC2	Wpeg	commn. 1/ 3/42 (C10382) F/L retired 1/ 5/47
626.	Maskell, J.	Cpl	Wpeg	
1230.	Matthews, H.E.	Cpl	C.B.	discharged 16/ 4/40
6.	Maxwell, C.V.	ACl	AFHQ	discharged 1/ 3/27
1265.	McArthur, H.H.	ACl	C.B.	ACl discharged 11/ 7/24
1220.	McArthur, N.C.	AC2	C.B.	discharged 12/ 4/25
615.	McAskill, J.N.	Cpl	Wpeg	Cpl died at Winnipeg 5/12/24
1201.	McCauley, W.F.	LAC	C.B.	
801.	McConnell, Stanley	WO2	Ott.	commn. 15/ 5/41 (C5195) W/C retired 14/ 8/45
410.	McCurdy, A.H.	LAC	H.R.	discharged 6/ 5/26
816.	McDonald, J.P.	ACl	Ott.	LAC discharged 3/11/28
403.	McGrandle, William Johnson	Sgt	H.R.	commn. 15/10/40 (C2899) released
1241.	McLaughlan, John	FS	C.B.	commn. 1/ 6/28 (C102) F/O killed, fly.acc., 4/11/29
1226.	McLeod, James	AC2	C.B.	WO2 discharged 18/ 8/46
1217.	McNemamin, Hugh	AC2	C.B.	AC2 discharged 12/6/25
1263.	McPartlin, John Robert Emmet McKenzie	ACl	C.B.	commn. 15/12/40 (C3338) F/L retired 19/ 4/47
604.	Mealing, W.P.	ACl	Wpeg	FS discharged 21/11/38
621.	Meech, H. I.	AC2	Wpeg	ACl discharged 30/ 4/26
617.	Milne, Alexander John	ACl	Wpeg	commn. 24/ 4/43 (C25608) F/O retired 20/ 2/49 (20255)
606.	Minton, F.A.	AC2	Wpeg	AC2 discharged 30/ 6/24
1243.	Miscampbell, George Vernon	AC2	C.B.	commn. 15/11/39 (C1570) S/L killed, flying 15/ 5/43
1271.	Miscampbell, H.	AC2	C.B.	AC2 discharged 3/ 9/24
809.	Moodie, E.A.	Cpl	Ott.	discharged 20/ 7/26

No.	Name	Rank	Unit	Rank	and Date of Release
601.	Moon, George John	Sgt	Wpeg	S/L	commn. 15/12/39 (C1551) retired 5/ 1/45
1202.	Newton, J.	LAC	C.B.		discharged 31/ 1/31
11.	O'Donnell, J.E.	Cpl	AFHQ		discharged 9/ 3/29
628.	O'Malley, W.A.	AC2	Wpeg		
807.	Palmer, John Harold	Sgt	Ott.	F/L	commn. 24/ 3/41 (C4613) retired 23/12/44
623.	Palmer, L.T.	AC2	Wpeg	Sgt	discharged 21/ 2/30
214.	Partridge, W.G.	LAC	Van.		discharged 31/ 3/27
605.	Passey, H.	AC2	Wpeg	AC1	discharged 30/ 6/24
822.	Paterson, Robert McMillan	AC2	Ott.	W/C	commn. 15/ 5/41 (C5200) retired 29/12/46
405.	Pearce, William Maddock	Cpl	H.R.	F/L	commn. 15/ 5/40 (C1984) retired 19/ 3/45
1234.	Perry, L.	Sgt	C.B.		
620.	Philbrow, R.H.	AC2	Wpeg	AC1	discharged 4/ 5/26
1208.	Pinch, John Edmond	AC1	C.B.	F/L	commn. 15/ 5/41 (C5186) retired 27/ 2/46
633.	Powell, A.C.	AC2	Wpeg	Cpl	discharged 31/3/29
401.	Rabnett, Anthony Augustine	FS	H.R.	G/C	commn. 1/ 3/39 (C961) retired 5/ 8/45
634.	Ramsay, G.S.	AC2	Wpeg	AC2	discharged 11/ 8/24
1221.	Ramsden, William	Cpl	C.B.	S/L	commn. 15/10/40 (C2902) retired 7/ 1/47
1211.	Ramshaw, George Campbell	AC2	C.B.	F/L	commn. 15/ 5/41 (C5204) retired 26/11/49 (1211)
1203.	Raymond, Vivian Earl	FS	C.B.	W/C	commn. 1/ 4/39 (C967) retired 5/ 3/47
1240.	Redman, S.A.	LAC	C.B.		discharged 31/ 3/27
409.	Richards, A.	AC1	H.R.	Sgt	killed, fly.acc., 22/ 4/30
415.	Richards, Philip Edmunds	AC1	H.R.	F/L	commn. 15/12/40 (C3339) retired 7/11/45
1223.	Richardson, J.A.	AC1	C.B.		discharged 12/ 3/45
1006.	Ritcey, Burnham Edmund	AC2	Dart	F/O	commn. 11/ 2/42 (C9944) retired 13/ 2/45

No.	Name	Rank	Unit	Rank and Date of Release
406.	Robbins, Arthur Samuel	Cpl	H.R.	S/L commn. 9/ 9/40 (C2743) retired 21/ 2/47
1225.	Robillard, R.H.	LAC	C.B.	discharged 11/ 8/25
818.	Rolt, H.H.	AC1	Ott.	Cpl discharged 30/4/26
616.	Semple, Hugh Cannon	AC1	Wpeg	commn. 24/ 3/41 (C4620) released
814.	Shaw, Reginald John	LAC	Ott.	WO died 26/12/45
602.	Sheldon, Charles	AC1	Wpeg	W/C commn. 15/ 7/40 (C2270) retired 31/10/46
1213.	Skelly, F.M.	AC2	C.B.	AC2 discharged 19/11/24
803.	Smith, Harold Joseph	FS	Tech	commn. 15/ 7/40 (C2279) released 30/ 9/43
1206.	Smith, J.	AC1	C.B.	
821.	Smyth, Kenneth Malcolm	AC2	Ott.	WO2 died at Winnipeg 29/12/40
804.	Staveley, Walter	Sgt	Ott.	F/L commn. 15/10/40 (C2898) retired 4/ 4/45
607.	Stone, H.F.	AC1	Wpeg	discharged 16/ 3/44
1216.	Sullivan, E.C.	AC1	C.B.	LAC discharged 31/ 3/27
1005.	Sullivan, Timothy Joseph	LAC	Dart	F/L commn. 17/ 1/42 (C9383) retired 31/ 1/45
811.	Talbot, J.E.	Cpl	Ott.	discharged 31/ 3/27
219.	Tall , W.S.	AC2	Van.	Cpl discharged 17/ 5/28
1231.	Taylor, Lewis	FS	C.B.	F/L commn. 15/ 6/40 (C2134) retired 14/ 6/44
206.	Tennant, Ernest Clare	LAC	Van.	G/C commn. 1/ 7/39 (C1010) retired 13/ 5/47
215.	Terry, N.C.	LAC	Van.	FS discharged 15/ 2/29
4.	Thompson, William Gibbs	Sgt	AFHQ	commn. 15/ 5/41 (C5185) retired 29/11/44
417.	Tompkins, W.E.	AC2	H.R.	AC1 discharged 20/ 3/26
806.	Tyrrel, J.H.	Sgt	Ott.	Sgt discharged 31/ 3/25
1227.	Underwood, R.H.	AC1	C.B.	AC1 discharged 30/ 6/24
28.	Ware, James	AC1	Phot	WO1 died 4/11/43
413.	Warner, Arthur Hicklin	AC1	H.R.	W/C commn. 24/ 3/41 (C4614) retired 22/ 8/53 (413)

No.	Name	Rank	Unit	Rank	and Date of Release
1218.	Webb, A.B.R.	AC2	C.B.	LAC	discharged 30/ 1/28
1237.	Wibberley, James	FS	C.B.	S/L	commn. 31/ 7/41 (C6203) retired 3/ 4/ 45
5000.	Williamson, R.P.	LAC	AFHQ	LAC	discharged from Non-Permanent 10/ 6/24 re-enlisted in Permanent 11/ 6/24 (#16) discharged 28/ 2/26
208.	Wilson, W.A.	LAC	Van.	Cpl	discharged 16/ 6/26
209.	Young, F.	LAC	Van.	Cpl	discharged 15/ 5/26

Total: 194, of whom 189 had been serving in the Royal Canadian Air Force on 31 March 1924.

The list of airmen is not in a finished state. Many Christian names have not been filled in and dates of release require checking for many of the airmen. (In some cases an airmen was discharged, and after a lapse of a year or two - or more - re-enlisted, the dates given in this list may not in every case be final termination of service).

Appendix C4

The "Post-Originals"

APPOINTMENTS AND ENLISTMENTS IN THE ROYAL CANADIAN AIR FORCE IN THE PERIOD 2 APRIL - 31 DECEMBER 1924

1. OFFICERS

A. Permanent

No.	Name	Initial Rank	Date of Apptmt.	Final Rank	Remarks
C55.	Campbell, Archibald Patrick	P/O	16/6/24	G/C	to RAF 17/5/44
C52.	Carr-Harris, Brian Gethyn	P/O	16/6/24	W/C	killed, fly. acc., 6/7/42
C62.	Carr-Harris, Redford McLeod	P/O	16/6/24	P/O	killed, fly. acc., 19/8/26
C54.	Wait, Frank Goodell	P/O	16/6/24	A/V/M	retired 20/3/56
C15.	Tough, David	P/O (T)	30/6/24	F/L	retired 8/1/31

B. Non-Permanent

C69.	Anderson, Cyril Maurice	P/P/O	1/4/24	P/O	killed, fly. acc., 28/6/27
C70.	Durnin, Edward James	P/P/O	1/4/24	P/O	resigned 3/9/27
C93.	Durnin, Harold Murray	P/P/O	1/4/24	P/P/O	retired 27/8/24
C86.	Glynn, Basil Charles Creighton	P/P/O	1/4/24	P/P/O F/O	retired 10/3/25 re-apptd. 31/10/41 resigned 15/10/42
C71.	Slemon, Charles Roy	P/P/O	1/4/24	A/M	
C72.	Weaver, William Codington	P/P/O	1/4/24	P/O	killed, fly. acc., 11/7/27
C67.	Castle, Steven	P/P/O	1/5/24	P/P/O	retired 10/3/25
C63.	Collier, Austin Bruce	P/P/O	1/5/24	P/P/O	retired 10/3/25
C294.	Cooil, Thomas Reginald	P/P/O	1/5/24	P/P/O	retired 10/3/25
C328.	Day, William Peter	P/P/O	1/5/24	P/P/O	retired 10/3/25
C330.	Dean, William John	P/P/O	1/5/24	P/P/O	retired 10/3/25
C361.	Evans, Frank Lloyd	P/P/O	1/5/24	P/P/O	retired 10/3/25

No.	Name	Initial Rank	Date of Apptmt.	Final Rank	Remarks
C449.	Irvine, William Herbert	P/P/O	1/5/24	P/O	resigned 16/8/28
C473.	Kerr, Trevor Wylie	P/P/O	1/5/24	P/P/O	relinq. 29/8/25
C555.	MacLaggan Arthur Herbert	P/P/O	1/5/24	P/P/O	reitred 10/3/25
C96.	McBurney, Ralph Edward	P/P/O	1/5/24	A/V/M	retired 29/5/52
C572.	McKenzie, David Drummond	P/P/O	1/5/24	P/P/O	retired 10/3/25
C583.	McNeil, John	P/P/O	1/5/24	P/P/O	retired 10/3/25
C528.	Merrett, Joseph Stephen	P/P/O	1/5/24	P/P/O	retired 4/8/26
C534.	Moar, John	P/P/O	1/5/24	F/O	to Reserve 31/1/30
C603.	Patterson, Donald Skillman	P/P/O	1/5/24	P/P/O	retired 4/8/26
C676.	Stevenson, Arthur William Baring	P/P/O	1/5/24	P/P/O	killed, fly. acc., 27/7/26
C94.	VanVliet, Wilbur Dennison	P/P/O	1/5/24	G/C	died 25/10/42
C323.	Davis, Henry Austin	P/P/O	17/6/24	P/P/O	retired 31/8/26
C362.	Fair, Peter Collins Cleugh	P/P/O	17/6/24	P/P/O	retired 31/8/26
C403.	Griffiths, John Francis	P/P/O	17/6/24	P/P/O	retired 31/8/26
C97.	Johnson, Bertram Frederick	P/P/O	17/6/24	A/C	retired 28/7/46
C486.	LaRue, Abraham Alfred	P/P/O	17/6/24	P/P/O	retired 17/6/25
C35.	MacDonald, George Leslie	P/P/O	17/6/24	P/P/O	retired 4/8/26
C576.	McLaren, Henry Duncan	P/P/O	17/6/24	P/P/O	retired 31/8/26
C682.	Strathy, James Gowan Kirkpatrick	P/P/O	17/6/24	P/P/O	retired 31/8/26
C47.	Cross, Ronald Horace	F/O	16/7/24	F/O	killed, fly. acc., 24/2/25

Notes: 1. All the officers, except P/O Tough (in the Technical branch) were appointed for training as pilots; F/O Cross, a war-time pilot, was taking refresher training.

2. P/Os Campbell, Carr-Harris, Carr-Harris and Wait received outright commissions as they were graduates of R.M.C. P/O Tough had been an NCO in the C.A.F., and F/O Cross an officer in the R.A.F. during the war. The other appointments were all to the rank of Provisional Pilot Officer as the trainees were COTC Cadets or RMC Gentleman Cadets.

3. P/P/Os Anderson, Durnin, Durnin, Glynn, Slemon and Weaver were appointed for second year training, the dates of their appointment being made retroactive to 1 April 1924. The 17 P/P/Os appointed on 1 May 1924 (for first year training) were University COTC Cadets, and the 8 P/P/Os appointed on 17 June 1924 (also for first year training) were R.M.C. Gentleman Cadets.

2. AIRMEN

A. Permanent

(Airmen were allotted service numbers on a unit basis: the block 1 - 199 was for A.F.H.Q. and the Photographic Section; 200- for Vancouver; 400- for High River; 600- for Winnipeg; 800- for Ottawa and the Technical Depot; 1000- for Dartmouth; and 1200- for Camp Borden.)

No.	Name	Initial Rank	Date of Enlist.	Final Rank	Remarks
221.	Aldersley, Edgar Elkanah	LAC	16/4/24	S/L	commn. 15/7/40 (C2280) retired 13/2/46
1348.	Anderson, James Frederick	AC2	18/11/24		discharged 20/2/25
23.	Anton, Norman	AC2	12/12/24		discharged 27/9/27
1316.	Bamford, W.	AC2	7/7/24		discharged 2/12/24 (deserter)
1320.	Barker, Sydney George	AC2	8/7/24		discharged 17/3/46
1331.	Barnes, A.I.	AC2	28/7/24		discharged 9/12/24
647.	Biggs, Malcolm Payne	AC2	23/7/24	S/L	discharged 30/9/29 commn. 9/9/40 (C2745) retired 8/4/45
1291.	Blundell, F.	AC2	19/5/24		discharged 18/8/24
641.	Bond, Ralph Frederick McDonald	AC2	10/7/24		discharged 31/5/25
32.	Bourgoin, L.J.	AC2	24/7/24		discharged 4/7/44
1286.	Bradley, Robert Nelson	AC2	6/5/24	LAC	discharged 10/3/26
1310.	Braney, H.	AC2	5/7/24	AC1	discharged 4/7/27
649.	Brown, William Miller	AC2	7/8/24		discharged 25/9/24
1278.	Burwash, H.M.	AC2	14/4/24		discharged 11/7/24
1335.	Bury, J.	AC2	8/8/24	AC1	discharged 24/7/27
1315.	Cahill, J.J.	AC2	5/7/24		discharged 18/8/24
1281.	Caldwell, William	AC2	29/4/24		discharged 15/9/26
1302.	Cameron, D.	AC1	11/6/24		
1321.	Chambers, D.B.	AC2	12/7/24		discharged 8/1/29
1338.	Chambers, S.W.	AC2	13/8/24		discharged 7/10/24
1339.	Charbonneau, F.X.	AC2	13/8/24		
1350.	Chiasson, L.	AC2	21/11/24		discharged 25/8/28

No.	Name	Initial Rank	Date of Enlist.	Final Rank	Remarks
1330.	Clark, William Arthur	Cpl	24/7/24	F/O	commn. 1/9/41 (C6982) retired 8/12/43
1279.	Collins, Joseph Adolphus Clarence	AC2	16/4/24		commn. 15/5/41 (C5198) released
1282.	Connor, E.	AC2	30/4/24		SOS 27/1/26 (deserter)
639.	Cook, A.J.	AC2	3/7/24	LAC	discharged 30/4/26
638.	Couper, Thomas	AC2	1/5/24	LAC	discharged 31/8/26
659.	Craig, David Ora	AC2	15/12/24		
1311.	Craig, J.	AC2	5/7/24		discharged 9/6/25
1309.	Crawford, R.N.	AC2	4/7/24		discharged 3/7/27
1336.	Croome, Joseph Harold	AC2	14/8/24	Cpl	discharged 31/3/27
1313.	Dales, B.R.	AC2	7/7/24		discharged 26/9/25
1319.	Dawkins, F.C.	AC2	10/7/24		
656.	Dawson, Linn	AC2	4/12/24	AC1 S/L	discharged 30/4/26 commn. 15/6/40 (C2139) retired 12/1/48
424.	Dearaway, Stewart Clarke	AC2	3/10/24	W/C	commn. 1/8/40 (C2394) retired 13/11/45
1277.	Denning, S.G.	AC2	14/4/24	LAC	discharged 14/4/26
420.	Diller, Harry Sylvester	AC2	21/4/24	F/L	commn. 31/5/41 (C5427) retired 27/3/45
1323.	Diotte, Rene	AC2	14/7/24		discharged 28/8/24
1283.	Dohney, S.P.	AC2	1/5/24		discharged 14/1/25
31.	Dorion, W.A.	AC2	9/5/24	LAC	discharged 8/5/27
1298.	Downing, G.E.	AC2	27/5/24		discharged 26/8/24
1297.	Downing, W.	AC2	27/5/24	AC1	discharged 8/5/26
422.	Dowsett, S.C.	AC2	10/6/24		discharged 17/8/26
222.	Ellam, Leopold Garth Basil	AC2	17/4/24		discharged 31/3/26
1334.	Elliott, George Thomas	AC2	5/8/24	W/C	commn. 15/6/40 (C2136) retired 15/9/47
1305.	Elmer, C.S.	AC2	18/6/24		discharged 17/6/30
14.	Evans, G.F.	FS	7/4/24		discharged 15/5/24
17.	Follows, Edward James	AC2	30/6/24	S/L	discharged 6/12/26 commn. 15/12/40 (C3350) retired 10/1/50 (17)

No.	Name	Initial Rank	Date of Enlist.	Final Rank	Remarks
1328.	Foran, T.E.	AC2	23/7/24		
1292.	Fox, V.	AC2	19/5/24		discharged 16/8/24
1317.	Gask, L.W.	AC2	8/7/24	Cpl	discharged 12/9/24
645.	Gilchrist, David Robb	AC2	11/7/24	WO	died 14/7/44
1287.	Gilderdale, J.	AC2	6/5/24	Cpl	discharged 19/10/27
1304.	Gillespie, Frank Vincent	AC2	9/6/24	F/L	commn. 19/3/41 (C4509) retired 27/9/47
833.	Goldsmith, Lewis Leonard	AC2	11/12/24		discharged 21/12/26
1327.	Goodman, W.A.	AC2	24/7/24		discharged 3/2/25
1337.	Gordon, J.A.	AC2	14/8/24		discharged 31/7/26
419.	Green, Stanley Nuttall	AC2	9/4/24		discharged 6/5/29
1293.	Hargraves, John	AC2	20/5/24	S/L	commn. 31/5/41 (C5434) retired 13/1/49 (1293)
830.	Harris, Thomas Trevelleyn	AC2	18/9/24	W/C	commn. 15/5/40 (C1986) retired 24/7/56 (830)
1301.	Haverson, C.L.	AC2	10/6/24		discharged 9/6/25
1322.	Hellyer, G.E.	AC2	12/7/24		discharged 10/12/24
661.	Henderson, John Henry	AC2	15/12/24		
1273.	Henderson, S.G.	AC2	7/4/24		discharged 9/2/25
1308.	Heydon, R.L.	AC2	25/6/24		SOS 21/1/26 (deserter)
658.	Hunter, Harold Austin	AC2	15/12/24		discharged 31/3/26
18.	Ivey, Hartley Samson	Cpl	8/7/24	S/L	commn. 1/1/26 (C80) died 2/10/39
19.	James, Arthur Lorne	Sgt	16/7/24	A/V/M	commn. 16/7/26 (C83) retired 28/4/55
832.	Jamieson,E.G.	AC2	29/9/24		discharged 15/3/29
1276.	Jeffries, W.A.	AC2	14/4/24		discharged 9/6/25
1340.	Keighley, Walter	AC2	21/8/24	S/L	commn. 1/8/40 (C2393) retired 25/4/46
421.	Kneeves, Fred	AC2	23/4/24		discharged 15/8/24
810.	LaGrave, Henry Josias	AC2	14/4/24	S/L	commn. 31/5/41 (C5433) retired 15/5/47

No.	Name	Initial Rank	Date of Enlist.	Final Rank	Remarks
657.	Laidlaw, Robert	AC2	4/12/24	S/L	commn. 15/5/41 (C5201) retired 7/5/51 (657)
1324.	Latreille, A.	AC2	19/7/24		discharged 9/10/24
1307.	Little, J.C.	AC2	25/6/24		discharged 31/5/29
20.	Lofthouse, Charles Harold	Sgt	15/8/24		discharged 16/5/25
1303.	Lortie, George Rene	AC2	11/6/24	S/L	discharged 7/2/29 commn. 24/3/41 (C4618) retired 1/9/47
1008.	Lund, Fred	AC1	29/4/24	W/C	commn. 15/12/40 (C3356) retired 23/9/47
653.	Lunney, William	AC2	25/11/24	Sgt	discharged 3/8/37
652.	Madder, Cecil Leroy	AC2	25/11/24	LAC	discharged 31/12/26
1332.	Mann, T.C.	AC2	29/7/24	LAC	discharged 23/5/29
644.	McAdam, W.S.	AC2	10/7/24		discharged 8/10/24
1333.	McCulloch, J.J.	Cpl	2/8/24		discharged 2/8/27
825.	McDonald, O.K.	AC2	8/4/24	LAC	discharged 7/4/27
1285.	McFarland, C.A.	AC2	6/5/24		discharged 13/5/24
1325.	McGowan, J.	AC2	23/7/24		SOS 17/10/24 (deserter)
1295.	McKee, A.	AC2	21/5/24		discharged 9/6/26
1318.	McKinstry, E.M.	AC2	9/7/24		discharged 9/3/25
618.	McManus, John	AC2	11/4/24		discharged 11/7/24
1284.	Millar, Donald Sinclair	AC2	1/5/24		discharged 27/6/24
1294.	Milne, J.	AC2	20/5/24		discharged 28/9/27
1351.	Milton, Alexander Norman	AC2	2/12/24		discharged 30/4/25
15.	Mitchell, Austin James	AC2	25/4/24	F/O	commn. retired 3/12/55 (15)
1349.	Murphy, Daniel Pierce	AC2	18/11/24		discharged 31/1/25
33.	Neale, W.C.	AC2	20/8/24	F/L	commn. 12/3/42 (C10669) retired 24/12/46
1274.	Nesbitt, C.H.	Cpl	10/4/24		discharged 18/1/45
1314.	Nolan, Michael Joseph	AC2	7/7/24	W/C	discharged 13/12/29 commn. 15/7/40 (C2275) retired 7/4/54 (1314)

No.	Name	Initial Rank	Date of Enlist.	Final Rank	Remarks
829.	Nolet, Cyrille Henry	AC2	29/7/24	Sgt	died 15/10/44
223.	O'Neil, Irven Hodgins	AC2	19/6/24	F/L	commn. 31/5/41 (C5423) retired 23/8/46
643.	Paterson, A.R.	AC2	10/7/24	Cpl	discharged 23/3/29
642.	Phillips, R.G.	AC2	10/7/24		discharged 9/7/30
651.	Pickrell, Robert George	AC2	29/10/24	AC1	discharged 26/4/26
1288.	Pifer, John	AC2	12/5/24		discharged 26/6/24
648.	Platts, Edward Tandy	AC2	29/7/24		discharged 30/4/27
655.	Prime, Thomas Sidney	AC2	4/12/24		SOS 22/4/25 (deserter)
1346.	Quibbell, T.A.	AC2	4/11/24		discharged 6/2/25
1289.	Richardson, H.M.	AC2	12/5/24		discharged 9/2/25
22.	Rielly, Clarence Evelyn	AC2	26/11/24		
834.	Riggs, John Frederick	AC2	11/12/24	S/L	commn. 1/7/41 (C5775) retired 24/2/47
827.	Roberge, Hilaire	AC2	3/7/24	S/L	commn. 24/3/41 (C4615) retired 17/7/50 (827)
1300.	Robertson, A.	AC2	5/6/24		discharged 31/8/26
1329.	Roy, James Elzear Maxime Daniel	AC2	24/7/24	F/O	commn. 26/10/42 (C15909) retired 24/12/46
637.	Rushton, Joseph Leslie	AC2	11/4/24		discharged 30/6/24
1326.	Ryan, J.J.	AC2	23/7/24		discharged 29/10/24
1341.	Sherwood, John Richard	AC2	22/8/24	F/L	commn. 28/3/41 (C4622) retired 17/4/46
831.	Slemon, Theo Clarke	AC2	23/9/24	W/C	commn. 15/9/38 (C882) retired 17/9/44
1296.	Slesser, G.A.	AC1	26/5/24	Cpl	discharged 25/5/27
1272.	Southcott, A.J.	AC2	4/4/24		discharged 5/5/28
1306.	Spanton, R.V.	Boy	24/6/24		discharged 31/7/24
1347.	Stewart, A.G.	AC2	6/11/24		discharged 4/12/25
826.	Sutton, J.D.	AC2	12/5/24	Cpl	discharged 8/11/27

No.	Name	Initial Rank	Date of Enlist.	Final Rank	Remarks
1343.	Tapp, W.J.	AC2	22/8/24	AC1	discharged 14/4/25
220.	Taylor, George Bernard	AC2	9/4/24	Cpl	discharged 30/4/29
1344.	Taylor, J.W.	AC2	18/9/24		discharged 2/2/25
1345.	Taylor, W.R.	AC2	18/9/24		discharged 20/11/24
21.	Thomas, James Leslie	AC2	26/9/24	AC1	discharged 11/10/26
654.	Turland, Edward Bernard	AC2	25/11/24		
646.	Turnley, Cyril Echlin	AC2	12/7/24		discharged 21/8/24
1312.	Tyler, W.D.	AC2	5/7/24		discharged 5/9/24
828.	Vince, Archibald George	AC2	16/7/24	G/C	comman. 15/5/40 (C1985) retired 31/3/47
640.	Waite, A.R.	AC2	11/7/24	Cpl	discharged 8/6/31
423.	Warren, Alan Arthur	AC2	2/7/24		discharged 2/4/25
1280.	Warren, M.	AC2	17/4/24		discharged 11/7/24
1299.	Waters, Percy Alfred	AC2	4/6/24	W/C	comman. 15/6/40 (C2137) retired 1/6/47
1290.	Williams, James Douglas	AC2	15/5/24		discharged 26/5/28 comman. 7/11/42 (C20489) released
650.	Wilson, Albert Edward	AC2	4/9/24	LAC	discharged 20/3/28
224.	Winny, Harry Johnstone	AC2	24/9/24		comman. 29/11/39 (C1410) released
660.	Winship, Thomas	AC2	15/12/24	FS	died 8/12/32
1342.	Winstanley, F.	AC2	25/8/24		discharged 8/9/25

B. Non-Permanent

5003.	Adams, Albert Oliver	Sgt.	30/6/24	G/C	SOS 30/9/24 comman 1/6/26 (C91) retired 13/5/53 (91)
5013.	Beecher, R.H.	AC2	5/11/24		discharged 21/1/25
5011.	Coulson, R.L.	AC2	15/9/24		discharged 9/5/26 re-enlisted Permanent 10/5/26 (#1408) discharged
5008.	Doyle, Cecil Herbert	AC2	26/7/24		SOS 26/9/24 (deserter)
5005.	Edwards, F.G.T.	AC2	10/7/24		discharged 10/7/27

No.	Name	Initial Rank	Date of Enlist	Final Rank	Remarks
5009.	Gage, William V.	AC2	23/7/24		discharged 14/1/25
5010.	McCann, Harry William	AC2	30/7/24		SOS 23/9/24 (deserter)
5007.	Patenaude, Miles	AC2	26/7/24		discharged 26/1/25
					re-enlisted Permanent 27/1/25 (#1354)
				AC1	discharged 4/5/26
5006.	Robertson, E.G.	AC2	19/7/24		discharged 25/9/24
5004.	Staveley, J.R.	AC2	8/7/24		leave w/out pay 8/9/24
					discharged 12/9/26
					re-enlisted Permanent 13/9/26 (#56)
					discharged 10/6/30
5012.	Workman, W.H.	AC2	15/10/24		discharged 12/5/26
					re-enlisted Permanent 13/5/26 (#1409)
					commn.
				F/L	retired 3/10/49 (1409)
5000.	Williamson, R.P.	LAC	1/4/24		discharged 10/6/24
				AC1	re-enlisted Permanent 11/6/24 (#16)
					discharged 28/2/26
5001.	Horner, A. James	Cpl	13/4/24	(#808)	originally enlisted in Permanent 1/4/24; discharged 12/4/24 and re-enl. Non-Perm.
				W/C	released 12/9/46
5002.	Clark, Fitz Middleton	LAC	1/5/24	(#217)	originally enlisted in Permanent 1/4/24; discharged 30/4/24 and re-enl. Non-Perm.
				LAC	discharged 31/5/24

Note: All the Non-Permanent airmen were stationed at Camp Borden except Adams and Williamson at AFHQ, Staveley at Photographic Section, Horner at Ottawa, and Clark at Vancouver; Edwards was originally enlisted and attested at Dartmouth and then posted to Camp Borden.

Of the 151 airmen enlisted in the period 2 April - 31 December 1924, nine had been serving in the Royal Canadian Air Force on 31 March 1924. They were: #221 LAC Aldersley, E.E., #1310 AC2 Braney, H., #1302 AC1 Cameron, D., #639 AC2 Cook, A.J., #1319 AC2 Dawkins, F.C., #424 AC2 Dearaway, S.C., #14 FS Evans, G.F., #1008 AC1 Lund, F., and #1274 Cpl Nesbitt, C.H.

Appendix C5

PERSONNEL OF THE ROYAL CANADIAN AIR FORCE

1 April - 31 December 1924

By Stations

Officers and airmen appointed or enlisted on 1 April 1924 are listed alphabetically by rank. Appointments and enlistments after 1 April 1924 are appended to the list of original personnel and are listed chronologically by date of enrolment. The abbreviation (N-P) indicates Non-Permanent personnel.

Air Force Headquarters

W/C W.G. Barker (Acting Director)
W/C E.W. Stedman (Asst. Director, Supply and Research) (Technical)
S/L G. O. Johnson (Asst. Director, Air Staff and Personnel)
S/L G.M. Croil
S/L W.R. Kenny
F/L A.T.N. Cowley
F/L S.G. Tackaberry (Supply) (Stores)
F/L G.E. Wait
Brevet F/L F.C. Higgins
Brevet F/L F.J. Mawdesley
F/O A. Ferrier (Technical)
P/O W.E. Baker (Supply) (Stores)
F/L A.C. Snow (N-P)
F/L H.R. Stewart (N-P)

W/C J.L. Gordon (at RCAF Liaison Office, London, England)
W/C J.S. Scott (at RAF Staff College, England)

WO1 H.H. Atkinson (Clerk B)
WO2 D.W.M. Johnston (Storekeeper B)
FS F. Aldridge (Clerk B)
Sgt F.N. Brooks (Clerk B)
Sgt J. Greenhalgh (Draughtsman A)
Sgt W.G. Thompson (Clerk B)
Cpl A.C. Duggan (Clerk B)
Cpl J.E. O'Donnell (Storekeeper B)
LAC J.H. Dobson (Clerk B)
LAC J.C. Goldie (Clerk B)
LAC R.P. Williamson (N-P) (Storekeeper B)
AC1 C.H. Cotton (Draughtsman A)
AC1 A.L. Graham (Storekeeper B)
AC1 C.V. Maxwell (Clerk B)

FS G.F. Evans (Draughtsman A)
AC2 A.J. Mitchell (Standard)
AC2 E.J. Follows (Storekeeper B)
Sgt A.O. Adams (N-P) (Draughtsman A)
Cpl H.S. Ivey (Storekeeper B)
Sgt A.L. James (Draughtsman A)
Sgt C. H. Lofthouse (Fitter A.E.)
AC2 J.L. Thomas (Clerk B)
AC2 C.E. Rielly (Storekeeper B)
AC2 N. Anton (Clerk B)

Photographic Section

F/O E.R. Owen (Photographic)
P/O C. C. Walker (Photographic)

Sgt J. E. Dorion (Photographer A)
LAC A. M. Archdeacon (Photographer A)
LAC A. E. E. Church (Photographer A)
LAC J. E. W. Drolet (Clerk B)
AC1 L. MacDonald (Photographer A)
AC1 J. Ware (Aircraft Hand C)

AC2 W. A. Dorion (Aircraft Hand C)
AC2 J. R. Staveley (N-P) (Standard)
AC2 L. J. Bourgoin (Aircraft Hand C)
AC2 W. C. Neale (Aircraft Hand C)

R.C.A.F. Station Vancouver

S/L A.E. Godfrey
temp. F/L E. L. MacLeod
F/O A. H. Hull
P/O C. J. Duncan (Photographic)
P/O F. B. Gillespie (Stores)

FS R. W. Coupland (Carpenter AR A)
Sgt F. R. Corp (Carpenter AR A)
Sgt G. Gorrill (Fitter A.E. A)
Sgt J. MacAslan (Clerk B)
Cpl H. O. Bell (Machinist A)
Cpl H. E. Davenport (Fitter A.E. A)
Cpl A. Dickie (Carp. Boat Builder A)
LAC F. M. Clark (Clerk Steno B)
LAC W. Gear (Fitter A.E. A)
LAC W. G. Partridge (Fitter A.E. A)
LAC E.C. Tennant (Storekeeper B)
LAC N.C. Terry (Fitter A.E.A.)
LAC W. A. Wilson (Carpenter B)
LAC F. Young (Carpenter B)
AC1 A.S. Coburn (Carpenter B)
AC1 J. R. Johnson (Carpenter A.R.A)
AC2 A. D. Campbell (Driver M.T. C)
AC2 E. Huggard (Aircraft Hand C)
AC2 W. S. Tall (Aircraft Hand C)

AC2 G. B. Taylor (Standard)
LAC E. Aldersley (Clerk Stores B)
AC2 L. G. B. Ellam (Clerk Stores B)
AC2 I. H. O'Neil (Clerk Steno B)
AC2 H.J. Winny (Standard C)

R.C.A.F. Station High River

S/L A. A. L. Cuffe
F/L A. A. Leitch
F/O A. Carter
F/O C. H. Dickins
F/O E. G. Fullerton
F/O G. A. Mercer
P/O N. E. Sharpe (Stores)

FS A. A. Rabnett (Carpenter A.R. A)
Sgt T. Hayes (Rigger B)
Sgt W. J. McGrandle (Fitter A.E. A)
Cpl F. Little (Fitter A.E. A)
Cpl W. M. Pearce (Machinist A)
Cpl A. S. Robbins (Storekeeper B)
LAC A. Caggie (Carpenter A.R. A)
LAC E. W. Davey (Cabinet Maker A)
LAC W. E. Godfrey (Rigger B)
LAC C. H. Green (Fitter A.E. A)
LAC A. H. McCurdy (Carpenter A.R. A)
AC1 A. H. Bishop (Standard)
AC1 A. Richards (Fitter A.E. A)
AC1 P. E. Richards (Clerk B)
AC1 A. H. Warner (Fitter A.E. A)
AC2 R. M. Brazil (Clerk B)
AC2 F. Harlow (Aircraft Hand C)
AC2 W. E. Tompkins (Aircraft Hand C)

AC2 S. N. Green (Driver M.T. C)
AC2 H. S. Diller (Fitters Asst. C)
AC2 F. Kneeves (Fitters Asst. C)
AC2 S. C. Dowsett (Nightwatchman Std.)
AC2 A. A. Warren (Clerk B)
AC2 S. C. Dearaway (Driver G&S A)

R.C.A.F. Station Winnipeg

S/L B. D. Hobbs

F/L H. Edwards
F/L L. F. Stevenson
brevet F/L B. N. Harrop
F/O L. R. Charron
F/O K. M. Guthrie
F/O G. R. Howsam
P/O J. R. Cairns (Photographic)
P/O N. F. Mossop (Stores)

FS W. Gorham (Carp. Boat Builder A)
Sgt T. F. Cooper (Fitter A.E. A)
Sgt A. T. Livingstone (Rigger Aero A)
Sgt G. Moon (Clerk B)
Cpl B. M. Aronson (Storekeeper B)
Cpl B. Ceifets (Rigger Aero B)
Cpl T. H. Cressy (Fitter A.E. A)
Cpl J. Maskell (Motor Boat Crew B)
Cpl J. N. McAskill (Carp. Boat B. A)
ACl G. R. Horton (Aircraft Hand C)

ACl F. W. Long (Cook B)
ACl W. P. Mealing (Driver M.T. C)
ACl A. J. Milne (Fitters Asst. C)
ACl H. C. Semple (Rigger Aero B)
ACl C. Sheldon (Clerk B)
ACl H.F. Stone (Standard)
AC2 G. H. Coppen (Fitters Asst. C)
AC2 J. Dasey (Clerk B)
AC2 L. J. Davies (Standard)
AC2 F. J. Ewart (Standard)
AC2 R. W. Finch (Standard)
AC2 R. P. Hennessey (Standard)
AC2 A. E. Hopkins (Standard)
AC2 S. S. Joscelyn (Standard)
AC2 W. H. Lane (Standard)
AC2 H. Marsh (Machinist A)
AC2 R. Marshall (Fitters Asst. C)
AC2 H. I. Meech (Standard)
AC2 F. A. Minton (Standard)
AC2 W. A. O'Malley (Aircraft Hand C)
AC2 L. T. Palmer (Fitters Asst. C)
AC2 H. Passey (Clerk B)
AC2 R. H. Philbrow (Aircraft Hand C)
AC2 A. C. Powell (Standard)
AC2 G. S. Ramsay (Standard)

AC2 J. McManus (Standard)
AC2 J. L. Rushton (Standard)
AC2 T. Couper
AC2 A. J. Cook (Standard)
AC2 A. R. Waite (Standard)
AC2 R. F. M. Bond (Standard)
AC2 R. G. Phillips (Standard)
AC2 A. R. Paterson (Standard)
AC2 W. S. McAdam (Standard)
AC2 D. R. Gilchrist (Standard)
AC2 C. E. Turnley (Standard)
AC2 M. P. Biggs (Standard)
AC2 E. T. Platts (Standard)
AC2 W. M. Brown (Standard)
AC2 A. E. Wilson
AC2 R. G. Pickrell (Standard)
AC2 C. L. Madder (Standard)
AC2 W. Lunney (Standard)
AC2 E. B. Turland (Standard)
AC2 T. S. Prime (Standard)
AC2 L. Dawson (Standard)
AC2 R. Laidlaw (Standard)
AC2 H. A. Hunter (Standard)
AC2 D. O. Craig (Standard)
AC2 T. Winship (Standard)
AC2 J. H. Henderson (Standard)

R.C.A.F. Station Ottawa

F/L C. McEwen
brevet F/L J. L. M. White
P/O J. H. Hector (Stores)

WO2 S. McConnell (Fitter A.E. A)
FS R. G. Ford (Carpenter A.R. A)
Sgt J. Palmer (Capr. Boat Bldr. A)
ACl F. A. Hutchings (Carpenter A.R. A)
ACl G. LaGrave (Fitters Asst. C)
ACl J.P. McDonald (Carpenter A.R. A)

Sgt W. Staveley (Carpenter A.R. A)
Sgt J. H. Tyrrel (Fitter A.E. A)
Cpl A. J. Horner (Fitter A.E. A)
Cpl E. A. Moodie (Clerk B)
Cpl J. E. Talbot (Storekeeper B)
LAC D. E. MacKell (Clerk B)
LAC R. J. Shaw (Driver M.T. C)
ACl H. H. Rolt (Clerk B)
AC2 W. C. Boone (Fitters Asst. C)
AC2 A. Foubert (Fitters Asst. C)
AC2 W. Ireland (Guard & Watchman)
AC2 R. M. Paterson (Fitters Asst. C)
AC2 K.M. Smyth (Fitters Asst. C)

AC2 H. Roberge (Aircraft Hand C)
AC2 A. G. Vince (Carpenter A.R. A)
AC2 C. H. Nolet (Tailor B)
AC2 J. F. Riggs (Aircraft Hand C)

R.C.A.F. Technical Depot

S/L D. C. M. Hume (Technical)
P/O A. J. Ashton (Stores)
F/L A. L. Johnson (N-P) (detached to Canadian Vickers, Montreal)

FS H. J. Smith (Storekeeper B)
Sgt W. S. Haynes (Storekeeper B)
LAC L. P. Chandler (Clerk B)
ACl A. T. Hirsch (Clerk B)

AC2 O. K. McDonald (Standard)
AC2 H. J. LaGrave (Aircraft Hand C)
AC2 J. D. Sutton (Aircraft Hand C)
AC2 T. T. Harris (Aircraft Hand C)
AC2 T. C. Slemon (Aircraft Hand C)
AC2 E. G. Jamieson (Aircraft Hand C)
AC2 L. L. Goldsmith (Clerk Stores B)

P/O D. Tough (Technical

R.C.A.F. Station Dartmouth

brevet S/L J. H. Tudhope

FS M. Graham (Fitter A.E. A)
Sgt M. L. Colp (Carpenter A.R. A)
Cpl H. A. Dickson (Storekeeper B)
LAC T. J. Sullivan (Clerk Steno. B)
ACl J. E. Hertle (Carp. Boat Bldr. A)
AC2 A. E. Anderson (Fitters Asst. C)
AC2 B. E. Ritcey (Cook B)

ACl F. Lund (Fitter A.E. A)
AC2 F. G. T. Edwards (N-P) (Standard)

R.C.A.F. Station Camp Borden

Temp. W/C L.S. Breadner
S/L N. R. Anderson
F/L G. J. Blackmore (Quartermaster)
F/L G. E. Brookes
F/L R. J. Grant (Technical)
F/L G. V. Walsh
temp. F/L R. Collis
brevet F/L H. W. Hewson
F/O G. F. M. Apps

F/O F. S. Coghill
F/O F. J. Crossfield (Stores)
F/O J. L. E. A. de Niverville
F/O D. A. Harding
F/O F. V. Heakes
F/O T. A. Lawrence
F/O A. L. Morfee (Photographic)
F/O G. K. Trim
F/O A. H. Wylie (Stores)
S/L A. B. Shearer (N-P)

FS J. Boyd (Fitter A.E. A)
FS W. J. W. Gregson (Rigger B)
FS D. Lusk (Machinist A)
FS J. McLaughlan (Fitter A.E. A)
FS V. E. Raymond (Clerk B)
FS L. Taylor (Fitter A.E. A)
FS J. Wibberley (Carpenter A.R. A)
Sgt H.S. Alguire (Rigger B)
Sgt W. R. Allan (Clerk B)
Sgt R. J. Beaumont (Fitter A.E. A)
Sgt D. Black (Fitter A.E. A)
Sgt F. Hems (Machinist A)
A/Sgt C. K. Flewelling (Rigger B)
A/Sgt L. Perry (Driver M.T. C)
Cpl B. I. Barton (Fitter A.E. A)
Cpl R. G. Burton (Storekeeper B)
Cpl G. E. P. Byron (Fabric Worker B)
Cpl J. F. Duggan (Clerk B)
Cpl F. B. Fulford (Clerk B)
Cpl L. A. Garrard (Telephone Oper. B)
Cpl J. Godfrey (Discip. Standard)
Cpl G. L. Hobson (Rigger B)
Cpl W. Ramsden (Rigger B)
A/Cpl R. H. Cross (Clerk B)
A/Cpl H. E. Matthews (Cook B)
LAC R. R. Carrington (Driver MT. C)
LAC O. W. Chapman (Blacksmith A)
LAC A. Clarke (Labourer Standard)
LAC J. H. Lapointe (Fitter A.E. A)
LAC W. F. McCauley (Rigger B)
LAC J. Newton (Clerk B)
LAC S. A. Redman (Tailor B)
LAC R. H. Robillard (Storekeeper B)
AC2 H. McNemamin (Aircraft Hand C)
AC2 G. V. Miscampbell (Driver M.T. C)
AC2 H. Miscampbell (Batman Standard)

ACl A. Anderson (Aircraft Hand C)
ACl W. G. Attewell (Driver M.T. C)
ACl R. C. Bigland (Clerk B)
ACl R. F. Chisholm (Clerk B)
ACl W. G. Comrie (Storekeeper B)
ACl A. S. Couch (Labourer Standard)
ACl W. Dye (Carpenter B)
ACl S. H. Edwards (Clerk B)
ACl E. G. Fox (Storekeeper B)
ACl A. Holdsworth (Fitter A.E. A)
ACl H. H. McArthur (Clerk B)
ACl R. E. McPartlin (Clerk B)
ACl J. E. Pinch (Storekeeper B)
ACl J. A. Richardson (Armourer B)
ACl J. Smith (Despatch Rider C)
ACl E. C. Sullivan (Batman Standard)
ACl R. H. Underwood (Clerk B)
AC2 J. F. Armitt (Photographer A)
AC2 W. Baylis (Clerk B)
AC2 A. Bradley (Aircraft Hand C)
AC2 J.A. Briggs (Batman Standard)
AC2 A. Burley (Mess Orderly Stand.)
AC2 W. H. Burr (Bandsman B)
AC2 F. A. Coulson (Labourer Standard)
AC2 M. Currell (Aircraft Hand C)
AC2 A. E. Denning (Clerk B)
AC2 R. Elphick (Labourer Standard)
AC2 F. J. Going (Clerk B)
AC2 A. D. Harriott (Mess Orderly Stand.)
AC2 M. Hunt (Aircraft Hand C)
AC2 F. W. Kirkcaldy (Aircraft Hand C)
AC2 N. C. McArthur (Aircraft Hand C)
AC2 J. McLeod (Painter B)
AC2 G. C. Ramshaw (Aircraft Hand C)
AC2 F. M. Skelly (Batman Standard)
AC2 A. B. R. Webb (Aircraft Hand C)

P/P/O C. M. Anderson
P/P/O E. J. Durnin
P/P/O H. M. Durnin
P/P/O B. C. C. Glynn
P/P/O J. S. Merrett
P/P/O J. Moar
P/P/O D. S. Patterson
P/P/O A. W. B. Stevenson

P/P/O C. R. Slemon
P/P/O W. C. Weaver
P/P/O S. Castle
P/P/O A. B. Collier
P/P/O T. R. Cooil
P/P/O W. P. Day
P/P/O W. J. Dean
P/P/O F. L. Evans
P/P/O W. H. Irvine
P/P/O T. W. Kerr
P/P/O A. H. MacLaggan
P/P/O R. E. McBurney
P/P/O D. D. McKenzie
P/P/O J. McNeil
P/P/O W. D. VanVliet
P/O A. P. Campbell
P/O B. G. Carr-Harris
P/O R. M. Carr-Harris
P/O F. G. Wait
P/P/O H. A. Davis
P/P/O P. C. C. Fair
P/P/O J. F. Griffiths
P/P/O B. F. Johnson
P/P/O A.A. LaRue
P/P/O G. L. MacDonald
P/P/O H. D. McLaren
P/P/O J. G. K. Strathy
F/O R. H. Cross

AC2 A. J. Southcott (Driver M.T. C)
AC2 S. G. Henderson (Aircraft Hand C)
Cpl C. H. Nesbitt (Clerk B)
AC2 W. A. Jeffries (Mess Orderly Std.)
AC2 S. G. Denning (Rigger B)
AC2 H. M. Burwash (Clerk B)
AC2 J. A. C. Collins (Guard Standard)
AC2 M. Warren (Clerk B)
AC2 W. Caldwell (Guard Standard)
AC2 E. Connor (Labourer Standard)
AC2 S. P. Dohney (Guard Standard)
AC2 D. S. Millar (Tele. Oper. Asst. C)
AC2 C. A. McFarland (Cook B)
AC2 R. N. Bradley (Carpenter B)
AC2 J. Gilderdale (Labourer Standard)
AC2 J. Pifer (Labourer Standard)
AC2 H. M. Richardson (Aircraft Hand C)
AC2 J. D. Williams (Aircraft Hand C)
AC2 F. Blundell (Batman Standard)
AC2 V. Fox (Aircraft Hand C)
AC2 J. Hargraves (Clerk B)
AC2 J. Milne (Batman Standard)
AC2 A. McKee (Mess Orderly Std.)
AC1 G. A. Slesser (Clerk B)
AC2 W. Downing (Mess Orderly Std.)
AC2 G. E. Downing (Driver M.T. C)
AC2 P. A. Waters (Carpenter A.R. A)
AC2 A. Robertson (Guard Standard)
AC2 C. L. Haverson (Labourer Standard)
AC1 D. Cameron (Aircraft Hand C)
AC2 L. W. Gask (Clerk B)
AC2 E. M. McKinstry (Aircraft Hand C)
AC2 F. C. Dawkins (Storekeeper B)
AC2 S. G. Barker (Clerk B)
AC2 D. B. Chambers (Aircraft Hand C)
AC2 G. E. Hellyer (Labourer Standard)
AC2 R. Diotte (Clerk B)
AC2 A. Latreille (Sheet Metal Worker B)
AC2 J. McGowan (Labourer Standard)
AC2 J. J. Ryan (Cook B)
AC2 W. A. Goodman (Clerk B)
AC2 T. E. Foran (Clerk B)
AC2 J. E. M. D. Roy (Labour Standard)
Cpl W. A. Clark (Armourer B)
AC2 A. I. Barnes (Aircraft Hand C)
AC2 T. C. Mann (Aircraft Hand C)
Cpl J. J. McCulloch (Guard Standard)
AC2 G. T. Elliott (Fitters Asst. C)
AC2 J. Bury (Fitter A.E. A)
AC2 J. H. Croome (Fitter A.E. A)
AC2 J. A. Gordon (Labourer Standard)
AC2 S. W. Chambers (Fitter A.E.A)
AC2 F. X. Charbonneau (Tailor B)
AC2 W. Keighley (Aircraft Hand C)
AC2 J. R. Sherwood (Aircraft Hand C)
AC2 F. Winstanley (Aircraft Hand C)
AC2 W. J. Tapp (Guard Standard)
AC2 J. W. Taylor (Labourer Standard)
AC2 W. R. Taylor (Labourer Standard)
AC2 T. A. Quibbell (Labourer)

AC2 G. R. Lortie (Fitter A.E. A)
AC2 F. V. Gillespie (Clerk B)
AC2 C. S. Elmer (Clerk B)
Boy, R. V. Spanton (Storekeeper B)
AC2 J. C. Little (Clerk B)
AC2 R. L. Heydon (Clerk B)
AC2 R. N. Crawford (Storekeeper B)
AC2 H. Braney (Aircraft Hand C)
AC2 J. Craig (Standard)
AC2 W. D. Tyler (Aircraft Hand C)
AC2 B. R. Dales (Labourer Standard)
AC2 M. J. Nolan (Clerk B)
AC2 J. J. Cahill (Clerk B)
AC2 W. Bamford (Fitter A.E. A)

AC2 A. G. Stewart (Clerk B)
AC2 J. F. Anderson (Photographer A)
AC2 D. P. Murphy (Clerk B)
AC2 L. Chiasson (Storekeeper B)
AC2 A. N. Milton (Standard)
AC2 E. G. Robertson (N-P) (Clerk)
AC2 M. Patenaude (N-P) (Labourer Std.)
AC2 C. H. Doyle (N-P) (Labourer Std.)
AC2 W. V. Gage (N-P (Standard)
AC2 H. W. McCann (N-P) (Labourer)
AC2 R. L. Coulson (N-P) (Labourer Std.)
AC2 W. Workman (N-P) (Labourer Std.)
AC2 R. H. Beecher (N-P) (Clerk)

DISTRIBUTION OF PERSONNEL OF THE ROYAL CANADIAN AIR FORCE

By Ranks and Units

(1 April - 31 December 1924)

Note: In the three following tables the upper left figure in each column refers to the original personnel on 1 April 1924; the lower right figure refers to those appointed or enlisted after 1 April 1924.

Rank	AFHQ	Phot	Van.	H.R.	Wpeg	Ott.	Tech	Dart	C.B.	Totals
W/C	4								1	5
S/L	3		1	1	1		1	1	2	10
F/L	7		1	1	3	2	1		6	21
F/O	1	1	1	4	3				10	20
									1	1
P/O	1	1	2	1	2	1	1			9
							1		4	5
P/P/O									31	31
Total Officers	16	2	5	7	9	3	3	1	19	65
							1		36	37
WO1	1									1
WO2	1					1				2
FS	1		1	1	1	1	1	1	7	14
		1								1
Sgt	3	1	3	2	3	3	1	1	7	24
		3								3
Cpl	2		3	3	5	3		1	11	28
		1							3	4
LAC	3	3	7	5		2	1		8	29
			1							1
AC1	3	2	2	4	7	4	1	1	17	41
								1	2	3
AC2			3	3	19	5		3	22	55
	5	4	4	6	26	4	7	1	81	138
Boy									1	1
Total Airmen	14	6	19	18	35	19	4	7	72	194
	10	4	5	6	26	4	7	2	87	151

DISTRIBUTION OF OFFICERS OF THE ROYAL CANADIAN AIR FORCE

By Branch

Branch	W/C	S/L	F/L	F/O	P/O	P/P/O	Totals
Permanent							
Gen. List (Flying)	4	8	15	15			42
					4		4
Gen. List (Phot.)				2	3		5
Gen. List (Tech.)	1	1	1	1			4
					1		1
Non-F. List (Stores)			2	2	6		10
Non-Permanent							
Gen. List (Flying)		1	3				4
				1		31	32
Totals	5	10	21	20	9		65
				1	5	31	37

DISTRIBUTION OF AIRMEN OF THE ROYAL CANADIAN AIR FORCE

By Trades and Units

(1 April - 31 December 1924)

Trade	AFHQ	Phot	Van.	H.R.	Wpeg	Ott.	Tech	Dart	C.B.	Totals
A/c Hand	1		2	2	3				9	17
		3				2	5		14	24
Armourer									1	1
									1	1
Bandsman									1	1
Batman									4	4
									2	2
Blacksmith									1	1
Cabinet Maker				1						1
Carpenter			3						1	4
									1	1
Carp. Air R.			3	5	3	4		1	7	23
						1			2	3
Carp. Boat B.			1		2	1		1		5
Clerk	8	1	1	2	4	3	2		15	36
		2		1					20	23
Clerk Sten.			1					1		2
			1							1
Cook					1			1	1	3
									2	2
Desp. Rider									1	1
Disciplin.									1	1
Draughtsman	2									2
	3									3
Driver G&S				1						1

DISTRIBUTION OF AIRMEN OF THE ROYAL CANADIAN AIR FORCE (cont'd)

Trade	AFHQ	Phot	Van.	H.R.	Wpeg	Ott.	Tech	Dart	C.B.	Totals
Driver M.T.			1	1	1	1			4	7
				1					2	3
Fabric Wrkr.									1	1
Fitter A.E.			5	5	2	3		1	8	24
	1							1	5	7
Fitters Asst.					4	5		1		10
				2					1	3
Guard						1				1
				1					6	7
Labourer									4	4
									17	17
Machinist			1	1	1				2	5
Mess Orderly									2	2
									3	3
Motor Boat Crew					1					1
Painter									1	1
Photographer	4								1	5
									1	1
Sheet Met. Wkr.									1	1
Standard				1	12					13
	1	1	2		26		1	1	3	35
Store-kpr.	4		1	1	1	1	2	1	5	16
	3		2				1		4	10
Tailor									1	1
						1			1	2
Tele. Opr.									1	1
Tele. Opr. Asst.									1	1
Total at 1 Apr.	24	14	6	19	18	35	19	4	7	72	194
Total after 1 Apr.	21	10	4	5	6	26	4	7	2	87	151

Appendix D Abbreviations

AAAF	Auxiliary Active Air Force
A/C	Air Commodore
AED	Aeronautical Engineering Division
AFC	Air Force Cross
AFHQ	Air Force Headquarters
AID	Aircraft Inspection Detachment
Air Rank	A/C, A/V/M, A/M, A/C/M
AMOT	Air Member for Organization and Training
AMP	Air Member for Personnel
AOC	Air Officer Commanding
APR	Appointments, Promotions, Retirements
A/V/M	Air Vice Marshal
BCATP	British Commonwealth Air Training Plan
'BF'd'	Bring Forward
Brig-Gen	Brigadier-General
CAF	Canadian Air Force
CAMC	Canadian Army Medical Corps
Capt.	Captain
CARC	Corps d'aviation royal canadien
CAS	Chief of the Air Staff
CB	Companion of the Order of the Bath
CCA	Controller of Civil Aviation
CGAO	Civil Government Air Operations
CGS	Canadian Government Ship
CGS	Chief of the General Staff
CMG	Companion of the Order of St. Michael and St. George
CO	Commanding Officer
COTC	Canadian Officers Training Corps
CST	Central Standard Time
DCRA	Dominion of Canada Rifle Association
DFC	Distinguished Flying Cross

DOC	District Officer Commanding
DSC	Distinguished Service Cross
DSO	Distinguished Service Order
F/L	Flight Lieutenant
F/O	Flying Officer
F/S	Flight Sergeant
FTS	Flying Training School
Gen.	General
GOC	General Officer Commanding
GP	General purpose
HMCS	Her (His) Magesty's Canadian Ship
Hon.	Honourable
KC	King's Council
KCMG	Knight Commander of the Order of St. Michael and St. George
KRO	King's Regulations and Orders
LLD	Doctor of Laws
Lt.-Col.	Lieutenant-Colonel
Lt.-Govr.	Lieutenant-Governor
MBE	Member of the Order of the British Empire
MC	Military Cross
MD	Military District
MM	Military Medal
MO	Medical Officer
MST	Mountain Standard Time
NCO	Non-Commissioned Officer
NPAAF	Non-Permanent Active Air Force
N.W.T.	NorthWest Territories
OBE	Officer of the Order of the British Empire
OC	Officer Commanding
'PA'	Put away
PAAF	Permanent Active Air Force
PC	Privy Council

PD	Photographic Detachment
P/O	Pilot Officer
P/P/O	Provisional Pilot Officer
'psa'	passed Staff College Air.
'qs'	qualified short course R.N. Staff College, Greenwich
R.A.F.	Royal Air Force
RCAF	Royal Canadian Air Force
RCAMC	Royal Canadian Army Medical Corps
RCASC	Royal Canadian Army Service Corps
RCCS	Royal Canadian Corps of Signals
RCMP	Royal Canadian Mounted Police
RCN	Royal Canadian Navy
RCNAS	Royal Canadian Naval Air Service
RCNVR	Royal Canadian Naval Volunteer Reserves
RFC	Royal Flying Corps
RNAS	Royal Naval Air Service
RNWMP	Royal North-West Mounted Police
R/T	Radio telephone
SAO	Senior Air Officer
S/L	Squadron Leader
(the) Soo	Sault St. Marie
SS	Steam ship
SSF	School of Special Flying
SSC	Short Service Commission
TDS	Training Depot Station
VC	Victoria Cross
W/C	Wing Commander
W/T	Wireless telegraph

Index

Abray, J.W. 224
Accommodations, 148
Active Air Force, 116, 120.
-Non-Permanent Active Air Force, 116, 119, 145, 150, 208, 224, 265, 279, 291f, 303, 315, 326, 330, changed to Auxiliary Active Air Force, 359.
-Permanent Active Air Force, 116, 119, 125, 145, 150, 224, 291f, 302f, 315, 326, 330, 361, 380.
Adams, A.O., 274, 332.
Advisory Air Council, 371.
Aerial photography, 21, 33, 34, 36f, 57f, 61, 69, 72, 75, 78, 87, 104f, 108, 110f, 112, 128f, 132, 134f, 138f, 147, 153, 156f, 160f, 167, 170f, 189, 195, 209, 211f, 229, 240f, 253, 269, 293, 303, 305, 320, 341, 367, 383.
Aerial photography detachment, 212, 229, 233, 240, 254.
Aerial survey, 36, 60, 111, 128, 134, 138, 189, 194.
Aerial survey camera, 57, 78, 129, 135, 213.
Aeronautical Engineering Branch, 181, 205, 220, 234, 258, 274, 309.
-Publications Branch 302.
Aeronautical Intelligence 38, 53.
-Intelligence liaison course, see Training.
Aeroplane rigging, 65, 113.
Agriculture services (see also Pest Control) 57, 70, 104, 107, 151f, 158f, 190, 214, 230, 243, 255.
Air Board, 2f, 6f, 10, 39, 91, 98.
-Bill for the establishment of, 2f.
-chairman of, 3.
-composition of, 6.
-duties of, 3f.
-formation of, 2.
-finance 12, 14.
-secretary 6f, 34, 43.
see also Flying Operations Branch
Air Cadet Corps 366.
Air Command, 358.
Air Council, 358.
Air Defence, 35, 179, 310f, 327, 371, see also Northern Defences.
Air Force Headquarters, 330.
-Air Staff Division 330.
Air mail services, see Mail Services
Air Ministry 6, 15, 38, 41, 164, 308, 328f.
Air regulations, 7f, 38, 47.
Air stations, 1, 14, 25, 33, 35, 95, 122, 127, 145, 151, 156, 168, 187, 209, 244, 253, 256, 276.
-Camp Borden, 14, 16, 23f, 38, 86, 92, 101, 122, 145, 184, 187, 222, 235, 249.
-Cormorant Lake, 164, 193.
-Dartmouth, 1, 33, 56, 78, 86, 112, 138, 160, 197, 244, 293, 359.
-Eckville 36.
-High River 23, 36, 61, 70, 72, 80, 108, 131, 153, 164, 192, 214, 227, 253, 256.
-Jericho Beach, 14, 33f, 56, 62, 70f, 106, 129, 151, 184, 197, 224, 248, 310, 339.
-Lac du Bonnet, 164, 193.
-Ladder Lake 193.
-Morley, 14, 33, 35f.
-Norway House, 109, 164, 193, 253.
-Nottingham Island 199f.

-Ottawa, 6, 14, 33, 36f, 47, 57, 77, 111, 138, 147, 160, 173, 187, 198, 225, 233, 245, 257, 276, 264, 303.
-Parry Sound, 59, 75.
-Port Burwell, 198f.
-Roberval, 14, 33, 56f, 76f.
-Rocky Mountain House, 164.
-Shirley's Bay 160, 216.
-Sioux Lookout, 58f.
-Sydney, 1, 33.
-The Pas 74, 109f, 134.
-Trenton 222, 248, 252, 276, 287, 316, 363.
-Victoria Beach 58f, 61, 109, 133, 164.
-Wakeham Bay 199f.
-Whitney 59, 75.
-Winnipeg 94, 133, 193, 244, 256
-changed to C.A.F. Unit, 106
-changed to "RCAF Station..." 264.
Air Training Command 358.
Aircraft 5f, 28, 36, 56, 60, 81, 96, 105, 141, 144, 149, 160, 174, 193, 205, 210f, 214f, 227, 239, 246, 278, 289, 302, 313f, 327, 334, 342, 349, 371, 380.
-Armstrong-Siddeley CIVET 309, 313.
-Armstrong-Siddeley Genet Engine 175.
-Armstrong-Siddeley Serval Engine 309.
-Armstrong-Whitworth ATLAS 210, 302.
-Armstrong-Whitworth SISKIN 169, 210, 250.
-Avro AVIAN 312.
-Avro 621 TUTOR 313.
-Avro VIPER 82, 134, 148, 156.
-Avro 504K 6, 20, 37, 75, 81, 209.
-BELLANCA 254.
-Bellanca PACEMAKER 227.
-Blackburn SHARK 310, 313.
-Bristol FIGHTER' F2B 6, 37.
-Curtiss H16 6, 109.
-Curtiss HS2L 6, 34f, 49, 56f, 64, 75f, 82, 108f, 129f, 151, 153, 160, 168.
-Curtiss JN4 6.
-Curtiss ORIOLE 72.
-Curtiss-Reid RAMBLER 221, 227, 234.
-De Havilland D.H.4 6, 20, 35, 37, 56f, 61, 63, 72f, 78, 108f, 131f, 133, 153, 169, 192.
-De Havilland D.H.9a 6, 20, 37, 42f, 84.
-De Havilland MOTH 175, 198, 209, 221, 227, 313.
-De Havilland PUSS MOTH 245, 258.
-De Havilland TIGER MOTH 313.
-Fairchild FC2W 216, 232, 254.
-Fairchild-71, 254.
-Fairchild SUPER-71, 341.
-Fairey seaplane 6, 42.
-Fairey F.3, 6, 41, 56, 59f, 64, 74, 82.
-Flying boats 312.
-Fokker Monoplane 198.
-Ford trimotor 227, 230, 234.
-Grumman GOOSE 381.
-Hawker AUDAX 285, 298.
-Hawker FURY 297.
-Hawker HART 324.
-Hawker HURRICANE 164, 180.
-Huff-Daland 190.
-Junker JL6 56, 72.

-Keystone PUFFER 190, 214, 243.
-Link Trainer 369.
-Noorduyn NORSEMAN 381.
-North American HARVARD 381.
-Northrop DELTA 311.
-Pitcairn MAILWING 227.
-Siddeley SISKIN 164.
-Sopwith SNIPE 6.
-SE5a, 6, 20, 84.
-Vickers VANCOUVER 220, 227, 234, 239.
-Vickers VANCOUVER II 245.
-Vickers VANESSA 174, 205.
-Vickers VARUNA 143f, 160.
-Vickers VEDETTE 142f, 160, 167, 170, 172, 174, 220, 227, 234, 240.
-Vickers VEDETTE IV 245, 397.
-Vickers VELOS 174, 220.
-Vickers VIGIL 174, 205, 227, 234.
-Vickers VIKING 96, 110, 113, 127, 129, 133, 135, 138f, 142, 151, 155f, 160, 167, 170, 172, 220.
-Vickers VIMY 37.
-Vickers VISTA 174, 205, 220.
-Westland WAPITI 245, 302, 313.
Aircraft industry 220, 348, 397.
Aircraft inspection 63, 82, 102, 220, 234, 332.
Airships
-H.M. AIRSHIP R100, 400.
-H.M. AIRSHIP R101, 401.
Airworthiness Conference 274
Aldridge, F. 12.
Amundsen, Capt. Roald, 72.
Anderson, A. 146, 184, 190, 249, 251.
Anderson, C.M. 100, 187, 192.
Anderson, N.R. 16, 20f, 23f, 102, 185, 187, 228, 257, 264, 358.
Annesley, W.R.B., 185, 187.
Annis C.L. 321, 391.
Anti-freeze mixtures 39, 65, 109, 113.
Apps, J.F.M. 251.
Arctic expedition (1922) 79f.
Arms race 326.
Armstrong-Siddeley Motors Ltd. 321, 337.
Army Co-operation, 21f, 87f.
Arthur, C.E.F. 238.
Ashton, A.J. 164, 199, 251, 290.
Associate Air Research Committee 8, 38, 65, 82, 112.
Atkinson, H.H. 12.
Ault, J.G., 208.
Auxiliary Active Air Force, 359, 380.
-from N.P.A.A.F. 359.
Awards, 176, 304, 399, 401.

Bailey, Dr. D.L. 158, 191.
Baker, W.E. 251.
Barker, W.G., 87, 102f, 118f, 146, 166.
Baldwin, J.S., 273.
Ballantyne, C.C. 6.
Barograph diaphrams, 39, 65.
Barton, R.I., 208, 249.

Barron, J.A., 39, 92f.
Bath, C.L. 190f, 214.
Battle of Britain, 387.
Beamish, F.V., 225, 235.
Beaumont, B.W., 282.
Béland, H.S., 15
Bell, Dr.A.G. 3.
Belle Isle mail service 271f.
Bell-Irving, A.D. 265, 340, 360.
Belton, Rev. F.K., 360.
Bennett, R.B. 235.
Bennett, W.E. 208, 236, 322, 337, 350.
Berry, D. 16.
Berven, J.L. 321.
Bethune, H.N. 16.
Biggar, O.M., 6, 91f, 167, 188.
Birks, P.F. 365.
Bishop, W.A., 3, 248
Black, D. 28, 199.
Blackmore, J.G., 12, 23.
Blaine, D.S., 250, 266.
Blake, W.T. 71, 139.
Blanchard, S.S. 250, 367.
Blane, J.D., 321.
Bombs 325.
Boret, J.A. 251.
Boucher, W.J. 191.
Bourassa, H. 179.
Bowker, J.R. 249, 273.
Bradshaw, D.A.R. 250.
Breadner, L.S. 28, 94, 149, 166, 183, 185, 208, 216, 265, 307, 394.
Briese, R.G. 266.
Briggs, F.E.R. 321.
British Air Service Committee 161.
British North America Act 3.
British War Office 328.
Brookes G.E. 102, 149, 165, 185, 205, 304, 384.
Broome, L.E., 71, 139.
Brown, A.R., 16.
Brown, R.B., 208, 307.
Brown, W.G. 208.
Brown, W.W. 237f, 367, 389.
Browning Machine Gun 338.
Bruce, E.L., 59.
Bryans J.D. 273.
Bryans J.G. 322, 369.
Bryant, H. 249, 272.
Burpee, L.J. 58.
Busby, E.S., 6, 17.
Lord Byng, 27f, 99.

Cadets, see Air Cadet Corps, R.C.A.F. , C.A.F.
Caggie, A., 199.
Cairns, J.R., 133, 135.
Cameron, R., 35.
Cameron, R.A., 236, 249, 337.
Campbell, A.P., 185, 307.
Campbell, H.L., 208, 236f.

Camp Borden, see Air Stations
Canadian Air Force, 2, 6, 17f.
-administration, 10, 17f, 66, 93.
-cadet training, 86.
-commanding officer, 17.
-commissions, 12, 89f.
-constitution, 13, 17f.
-formation, 2.
-headquarters 12, 20.
-instructors, 20.
-motto, 20.
-officers, 88.
-personnel strength, 6, 10, 12f, 15f, 22f, 70, 84, 88, 93, 102.
-permanency, 26, 85.
-posting, 17f.
-ranks, 14, 17f.
-recruitment, 24f, 85.
-retirement, 18.
-training, 17, 21, 84f, see also Training ...
-uniforms, 19.
Canadian Air Force Association, 12, 18, 24, 30f.
C.A.F. Unit, 106, see also Air Stations
Canadian Air Squadrons 1f, 12.
Canadian Aviation Corps, 1.
Canadian Expeditionary Force, 8.
Canadian Flying Clubs Association, 402.
Canadian Pratt and Whitney Co. Ltd., 221.
Canadian Vickers Ltd., 42, 44, 96, 143, 174, 220, 397.
Canadian Wright Ltd., 221.
Carburetor operation, 39, 109, 234.
Carefoot, H.R., 225, 307.
Carew, H.W.P., 241.
Carr-Harris, B.G., 123, 159, 199, 251, 322.
Carr-Harris, R.M., 123, 146, 165, 171.
Carroll, J., 155.
Carscallen, H.M., 266.
Carter, A.W., 59, 72, 109, 131, 146.
Carter, F.M., 256.
Cathcart, J.H., 24.
Central Air Command, 377f.
Central Flying School, see Training Courses Abroad
Central Investigation Committee 325, 369.
Certificate Branch 6f, 42, 394f.
Chambers D.B., 199.
Chaplain Service 24, 360.
Charron, L.R., 76, 133, 171, 251, 267.
Cherrington, G.E., 249.
Churchill, W.S., 27.
Civil Aviation, 2, 4, 7, 10, 14, 22, 28, 39, 54, 67, 85, 93f, 179, 181f, 207, 222, 300, 310f, 394.
-transferred to Department of Transport, 311.
Civil Government Air Operations 6f, 10, 23, 25, 28, 33, 36, 56f, 69f, 92f, 98, 105f, 115, 127f, 151, 162, 167f, 181f, 188f, 211f, 227, 232, 240f, 253f, 305, 340, 367, 383f.
Civilian flying clubs, 207, 376, 399.
Clements, W.I., 236, 249, 366.
Cobb, H., 249.
Coghill, F.S., 166, 199.
Cold weather flying, 108, 112, 234.

Coldwell, M.J., 326f.
Coleman, S.W., 318.
Collins, J.A.C., 249.
Collis, R., 192, 264.
Commercial aviation, 4, 21, 104, 394f.
Committee on Civil Air Operations, 167.
Communications, see Wireless Communication.
Communist forces,
-aircraft 326.
Conn, K.B., 16.
Conservation Commission, 34.
Contracts, 175.
Controller of Civil Aviation, 311, 394f.
Cooke, H.L., 57, 78, 111.
Coolican, P.T., 271.
Cormorant Lake Air Station, see Air Stations...
Costello, M. 184, 307, 366.
Coulter, R.M., 6.
Cowley, A.T.N., 70, 106f, 188, 397.
Cox, P.B. 243.
Craig, H.C., 38, 65.
Creery, K.A., 28.
Croil, G.M., 28, 35, 61, 72, 99, 108, 131, 146, 166, 185, 187, 208, 235, 237, 265, 280, 282, 346, 358, 384.
Cronyn, W.H., 38, 94.
Crop-dusting, 190, 214, 230, 243, 255, see also Agriculture services.
Cross, R.H., 125.
Crowe, J. 43.
Cuffe, A.A.L., 16, 20, 23, 87, 108f, 131, 169, 185, 225, 264f, 358.
Curtis, W.A., 20, 340, 360.
Curtiss Aviation School, 79.
Curtiss-Reid Aircraft Co., 221.

Dartmouth Air Station, see Air Stations...
Davidson, A.T., 70, 107, 169.
Davidson, R., 135.
Davies, J.E. 47.
Davis, R.C., 367.
Davis, R.L., 321.
Davoud, P.Y., 249.
Defence, see Air Defence
Defence, Coastal reconnaissance, 35, 310.
De Havilland Aircraft of Canada Ltd., 221, 258,
Delhaye, R.A., 24.
Demonstration flights, 35, 77, 38, 161, 235, 250, 282, 297.
Dennis, F.W., 41.
de Niverville, J.L.E.A., 165, 272, 282.
Department of Agriculture 34, 56.
Department of Lands and Forests, 34.
Department of Marine and Fisheries, 8, 56, 60.
Department of Militia and Defence, 3, 6, 10, 16, 21, 36, 56.
Department of National Defence, 66, 91, 104, 141.
Department of the Naval Service, 1, 11, 36, 41, 46, 58.
Department of Transport, 206, 311, 324.
Desbiens, G.H., 249.
Deville, E., 10, 36, 57.
Devlin E.E., 363.
Dickins, C.H., 131, 400.

Directorate of Flying Operations, 56.
Doan, J.E., 249, 367, 389.
Dobson, J.M., 359.
Dogherty, F.W., 16, 20.
Dominion Aerial Exploration Co., 398.
Dominion Oxygen Co., 337.
Donations of Aircraft, 5f, 15, 54, 81, 96, 210.
-Air Ministry, 6, 15, 38, 41.
-Dept. of Militia and Defence, 6.
-No. 1, Aircraft Depot, 6.
-Overseas, 6.
-United Kingdom, 5, 39.
-U.S. Naval Flying Corps, 5.
Doran, E.G., 341.
Doucett, R.L., 335.
Doyle, M.G., 321.
Drummond, C.B. deT., 43.
Duncan, C.J., 35, 106, 129.
Duncan, J.R., 71.
Dunlap, C.R., 230, 307, 337.
Dunlop, G.P., 250, 386.
Durley, R.J., 8.
Durnin, E.J., 100, 123, 159.
Duval, N.A., 236.
Dyment, J.T., 184.

Eardley, J.T., 187, 195.
Easton, J.A., 321, 337.
Edwards, D.M., 236, 366.
Edwards, H., 20, 23, 133, 156, 166, 185, 264, 290, 340.
Edwards, R.L., 387.
Elliott, G.T., 208, 349.
Emergency kit, 217.
Empire Standard of Airworthiness, 274.
Engine test bed 234.
Equipment, 5, 33.
-donations of, 5, 88.
Estimates, 3, 5, 15, 33, 05, 66, 96, 114, 141, 162, 177, 207, 222, 235, 246, 259, 276, 287, 300, 310, 346, 373.
Evans, E.H., 250, 296.
Eve, A.S., 8.
Ewart, F.J., 199, 230, 249, 272, 367.
Expenditure, 1, 15, 33, 39, 141, 210, 253, 268, 388.
Experiments - see Research
Exploration Flights, 62 see also aerial survey.

Fairchild Aerial surveys Co. (of Canada) Ltd., 308.
Fairchild Aircraft Company, 366.
Fairey Aviation Co. Ltd., 44.
Fairweather, C.D., 16.
Falkenberg, C.F., 16, 20.
Ferguson, J.H., 366.
Ferrier, A., 166, 185, 264.
Fish
-stocking of, 63. see also Preventive Patrols
Fishery Patrols, 34, 169, 177.
Fitzherbert, C.H., 57.
Fleming, A., 249, 341, 384.
Flights
-defence, 35.
-demonstration, 35, 77, 138, 161, 235, 250, 282, 297.
-exploration, 62.

-HALIFAX - ROBERVAL (1920), 33.
-JERICHO BEACH - VICTORIA (1920), 34.
-OPERATION "ECLIPSE", 149.
-rescue, 137, 158, 228, 244, 269, 294, 305, 318.
-ROUND the WORLD, 71, 139.
-search, 138, 269, 293, 318f.
-SHUSWAP LAKE - KAMLOOPS (1920), 35.
-TRANS-CANADA (1920) 41f, (1926), 175.
-treaty money 74, 110, 136, 158, 269.
-VANCOUVER - VICTORIA (1920), 35.
Flying Operations Branch, 6f, 10, 23, 25, 28, 33, 36, 56, 69, 88, 92.
-consolidation with C.A.F., 92
see also Civil Government Air Operations
Flying regulations see Air regulations
Flying time 69f, 72, 78, 101, 104f, 108, 110, 114, 124, 127f, 131, 135, 147, 151, 155, 157, 161, 164, 167, 186, 209, 267.
-Camp Borden, 21, 84, 87f, 91.
-Dartmouth, 37, 56, 78, 82, 137, 160.
-High River 69f, 72, 76, 169.
-Jericho Beach 62, 66.
-Roberval, 37, 56.
-Rockcliffe, 57, 151.
-Sioux Lookout, 59, 75, 79.
-Shirley's Bay 160, 164.
-Victoria Beach 61, 63, 137.
-R.C.A.F., 195, 224, 235, 250, 304, 317, 335, 362.
-C.G.A.O., 187, 211, 240, 253, 367.
Flying Training Station 145, 165.
see also Training
Forbes, N.C.O., 225, 230f, 251, 272.
Ford, R.E., 43, 332.
Ford Motor Company, 337.
Forestry Patrol, 33f, 56, 59f, 61, 69f, 72f, 76, 96, 104, 107, 110, 134, 153, 169f, 189, 194, 215, 227, 240, 253, 269.
Fortey, J., 318.
Fraser, N.G., 50.
Fraser, R.G., 102.
Fraser T.E., 381.
Frizzle, J.R., 250.
Fullerton, E.G., 76, 135, 165, 176, 238, 251, 285, 380.

Galbraith, D.M.B., 23.
Geneva Disarmament Conference, 266, 326.
Geodetic Survey, 57, 73, 78, 104, 231, 253.
-Vancouver, 63, 71.
Geological reconnaissance, 59.
German territorial expansion, 326.
Gibb, R.F., 208, 249.
Gibbs, A.R., 399.
Gill, C.A.K., 236.
Gillespie, F.B., 106, 129.
Gilmour, R., 367, 384, 389.
Glen, J.A., 20, 87, 92.
Gobeil, F.M., 225, 235, 250, 267, 366.
Godfrey, A.E., 71, 78, 87, 106f, 129, 140, 146, 151, 175, 216, 257, 265, 358, 366.
Gordon, J.L., 21, 28, 87, 93, 118, 124, 182, 188, 216, 251, 264, 271, 280.
Gordon, R.C., 208, 319, 337.
Graham, J.P., 66, 91, 96.
Graham, M., 216.
Grandy, R.S., 23, 78, 87, 149, 165, 214, 216, 220, 231, 238, 251,

Grant, R.J., 102, 185, 264.
Great Britain
-arms race, 326.
Green, H.C., 310.
Greene, S.A., 232.
Greenaway, K.R., 176.
Griffin, F.G., 149.
Ground Instruction School, 23, 79, see also Training.
Gussow, H.T., 159.
Guthrie, H., 10, 14f, 27, 54f, 66f, 162, 177.
Guthrie, K.M., 133, 267.
Gwatkin, Sir Willoughby, 10, 12, 22, 27f, 66, 70, 91f, 98.

Haig, Earl., 160.
Halifax Herald, The, 41, 44.
Hand, J.P., 251.
Hanna, W.F., 243.
Harding, D.A., 165, 273, 341.
Harding, W.G., 108, 225.
Harling, L.A., 249.
Harrop, B.N., 133, 197.
Hartridge, A.L. 35.
Hawtrey, R.C., 225, 235, 250, 337.
Head, T.A., 225.
Heakes, F.V., 102, 366.
Heaslip, R.T., 176.
Heath, C.W., 42, 56.
Hendrick, M.M., 250, 296, 337.
Henning, J.L., 321, 336.
Herington, C.F., 366.
Heslop, H.W., 185.
Hewson, H.W., 225, 248, 250, 267.
Higgins, F.C., 8, 38, 166, 307.
High River Air Station, see Air Stations ...
Hinton, H.N., 366.
His Majesty's Airship R100 400, R101, 401.
Hitchen, G.J., 250.
Hitler, A.,
-armament race, 326.
Hobbs, B.D., 35, 43, 46, 59f, 109, 133f, 135, 394.
Holland, H.L., 57, 78, 82.
Holland, W.J.G., 165.
Home-Hay, J.B., 44, 48.
Honourary Advisory Council for Scientific and Industrial Research, 8.
Hook, L.W., 366.
Horner, A.J., 184, 249.
Horsey, G.F., 60.
Hose, W., 10.
Howsam, G.R., 72, 109, 133, 156, 236, 265.
Hudson Strait Expedition 180, 185, 187, 197f.
Hull, A.H., 129f, 165, 187, 208, 224f, 340, 392.
Hume, D.E.M., 102, 225.
Hunter, J.D. 249, 267, 272.
Hurley, J.L., 236, 366.

Imperial Conference, 15, 178.
Imperial Oil, 43f, 56.
Inactive Squadrons, 24.

Industry, see Aircraft Industry.
Inglis, R., 337.
Insect control, 35, 57, 63, 230, 256, see also Pest control
Inspection see Aircraft Inspection
Instrument flying, 237f, see also Training.
Intelligence Branch C.A.F., 8, 38.
Interdepartmental Committee on Air Surveys and Base Maps, 340, 367, 384.
Interdepartmental Committee on Civil Air Operations, 187.
International Convention for Air Navigation, 7.
International Commission on Air Navigation, 398.
International Joint Commission, 56, 58, 62, 73.
Italian territorial expansion, 326.
Ivey, H.S., 282, 340.

James, A.L., 225, 237, 251, 337.
Jasper, H.B., 321.
Jericho Beach Air Station see Air Stations....
Joel, G.E., 43.
Johnson, A.L., 82.
Johnson, B.F., 165, 296.
Johnson, G.O., 28, 47, 118, 170, 185, 193, 264, 280, 337, 358.
Jones, W.A., 236f, 322.
Joy, D.G., 16, 20, 23f.

Keighley, W., 199.
Kennedy, A.J., 366.
Kennedy, H.M., 184.
Kennedy, W.W., 287.
Kenny, W.R., 28, 34, 56, 76, 166, 185.
Kerr, J.G., 208, 237.
Kimball, G.F., 225.
King George VI, 340.
King, W.L.M., 15, 66, 91, 141, 162, 177, 206, 235, 301, 350.
Kirkcaldy, F.W., 199.

Lambart, H.F., 37, 63, 73f.
Laurentide Air Services Ltd., 398
Lawrence, T.A., 102, 198f, 267, 307, 322.
Leckie, R., 7, 10, 22, 28, 33, 35, 37, 42, 44f, 49f, 56, 58, 92.
Leigh, Z.L., 176.
Leitch, A.A., 61, 72, 108, 131, 146, 198f, 227, 251.
LeMoine, G.A.A., 225, 228.
LeRoyer, J.A., 23, 43, 82, 394.
LeSueur, A.J., 78, 87.
Lewis, A. 199, 225, 238, 307, 391.
Library, 38.
Lighter-than-air-services, 39, 54.
Logan, R.A., 20, 23, 79.
London, R.A., 225.
Louden, J.A.H., 307.
Lucking, D.F., 225.
Luftwaffe, 326.

MacBrien, J.H., 98.
McBurney, R.E., 267, 285, 307, 366.
MacCaul, D.H., 307, 322.
MacDonald, D.F., 225.

Macdonald, E.M., 97, 114, 141.
MacDonald, H.A., 249.
McEwen, C., 34, 75, 78, 111, 138, 237, 251.
McGowan, E.A., 208.
MacInnis, J.A., 335.
McIntosh, R.H., 139.
McKay, A.H., 12.
McKee, J.D., 175, 216, 399.
Mackenzie, I., 287, 301, 310, 326, 346f, 371.
McKergow, Prof., 39, 65, 82.
MacLaren, A.C.S., 139.
MacLaren, D.R., 248.
McLaughlan, J., 43, 225.
MacLaurin, C., 34f, 41, 62, 71f.
MacLean, A.K., 2.
McLennan, J.C., 8.
MacLeod, E.L., 70, 106, 129f, 133f, 140, 144, 151, 155, 185, 224, 235, 248, 265.
Macmillan, N., 139.
McMillan, S.R., 184.
McNab, E.A., 208, 235, 250, 273, 337, 390.
McNaughton, A.G.L., 271.
McNee, J.W., 249.
MacPhail, A., 114, 206, 222, 348.
Macey, W., 366.
Machine guns, 102, 338.
Mail service, 43, 97, 112, 132, 196, 216, 255, 270f, 283, 288, 400, 402.
Mair, R.C., 225.
Manion, R.J., 377.
Mapping, 60, 111, 128, 134, 138, 189, 194.
Marchal, A. 139.
Marshall, R., 184, 249.
Mathews, R.A., 94.
Mawdesley, F.J., 185, 217, 228f, 242, 272f, 282, 381.
Medical services, 38, 94, 187, 239, 339, 362.
Meighen, A., 66f, 162, 177.
Mercer, G.A., 131, 225, 237, 251.
Meteorological Service of Canada
Metford, L.S., 24.
Mewburn, S.C., 3, 5f.
Michalski, W.J., 321.
Middleton, E.E., 165, 185, 296, 302.
Miles, C.W.E., 296.
Military Aviation, 3f, 6, 8f, 14f, 23, 63, 84, 114, 116, 151.
Miller, F.R., 337, 366, 369.
Miller, W.H., 16.
Milne, A.J. 135.
Miners, E.L., 321.
Minnes, R.V., 235, 238, 315.
Miscampbell, G.V., 249.
Mobile Photographic Training Flight, 233.
Mobilization for war, 379, 389.
Morfee, A.L., 76, 126, 149, 236, 282.
Morley Air Station see Air Stations....
Morrison, C.W., 225, 322.
Mossop, N.F., 133, 185.
Mowat, H.M., 4.
Mulock, R.H., 88, 248.
Murray, W.M., 266, 366.
Mussolini, B., 326.

National Defence Act, 91.
National Defence Unemployment Relief Camp, 276, 286, 312.
National Research Council, 298, 309, 368, 369.
Navy, Army and Air Supply Committee, 325, 369.
Nelles, D.H., 57.
Nivin, E.F., 23.
Non-Permanent Active Air Force, see Active Air Force...
Non-Permanent Reserve List, 248.
Northern Defence, 79f, see also Air Defence.
Northern Electric Company, 210.
No. 1 Canadian Wing, 2, 19f, 23, 164.
-headquarters, 20.
-School of Special Flying, 20, 23.
-Ground Instruction Section, 20, 23.
No. 1 Squadron 20, 23f.
North Pole Expedition Proposal, 72.

Oaks, Harold A., 176, 400.
O'Brian, G.S., 265.
O'Brien-Saint, J.T., 248.
Ocker, W.C., 237.
O'Connor, E.F., 249, 335.
Officers, 88, 116, 121, 150, 166, 225.
Oil, storage of, 65.
Omdal, Oscar, 72.
Ontario Pulp and Paper Company, 398.
Operation ECLIPSE, 145.
Orr, W.A., 250, 266, 322.
Ottawa Air Station, see Air Stations....
Ottawa Car Manufacturing Company, 175, 221.
Overseas Military Forces of Canada, 2.
Owen, E.R., 57, 78, 303.

Parachute, 103, 146, 154, 165, 208, 228.
Parkin, J.H., 8, 39, 65, 82.
Parliament, 2, 12, 54, 66, 114, 141, 162, 177, 206, 222, 235, 246, 310, 326.
-Debates, 15, 54, 66, 97, 114, 141, 177, 206, 222, 246, 260f, 287, 326, 326. see also Estimates
Pate, W.G., 321, 336.
Paterson, J., 39.
Patriarche, V.H., 208.
Patrick, M.M., 140.
Pattison, H.A.L., 281f,
Permanent Active Air Force, see Active Air Force...
Personnel strength, see Canadian Air Force...., Royal Canadian Air Force...
Pest control, 63, 70, 107, 151f, 158, 230, 256, see also Insect Control, Agriculture services, Crop-dusting.
Petersen, N.B., 250.
Peterson, O.J., 387.
Photography, see Aerial photography.
Photographic detachments, 212, 229, 240, 254.
Photography Equipment, 37, 57, 129, 135, 298, 368.
Pigeons, 22, 63, 125, 224, 227.
Pike, R.W., 239, 249.
Pilot training, 99f, 102, 108, 123, 145f, 165, 184, 208, 235, 249, 266, 280, 290, 321, 364, 375, 386.
-commissions, 100.
-R.A.F., 2, 5, 122, 124, 185, 209, 225, 350.
-remuneration, 100.
-requirements for, 100 see also Training.

Pinder, F.G., 16, 20.
Pirie, G.C., 297.
Pitt, G.H., 44.
Plant, J.L,, 249.
Pooler, G.D., 236.
Porsild, A.E., 244.
Porter, C.H, 34.
Pratt and Whitney Manufacturers, 337.
Pretty, W.P.G., 337.
Preventive patrols, 63, 68, 78, 106, 130, 293, 305, 340.
-illegal fishing, 63, 106f, 129f, 151.
-rum-running, 270.
-seal patrols, 248.
-smuggling, 62, 70, 106, 129f, 169.
Price, J.D., 296.
Pritchard, F.A., 16.
Procter, R.C., 250, 366.
Propellor, 132.
Publications Branch (A.E.D.), 302.

Quigley, H.S., 77.

Rabnett, A.A., 304.
Ralston, J.L., 177, 207, 22. 260, 287.
Ramsden, W., 199.
Rannie, J.L., 231.
Ready, J.M., 249.
Recruiting, 25, 85f.
-university students, 25, 123.
-R.M.C., 123.
Redpath, R.T., 12, 20, 22.
Registration of Aircraft, 81.
Religion, 24, 360.
Renison, Bishop, R.J, 360.
Rennie, D.A, 389.
Replacement aircraft, 81.
Rescue missions, 137, 158, 228, 244, 269, 294, 305, 318.
Research, 38f, 82, 109, 112f, 133, 171, 190, 205, 220, 231, 234, 245, 256, 258, 274, 285, 298, 309.
Research grants, 39, 66.
Reserve Air Force 116, 265.
Reserve of Officers, 265, 280, 361.
Reserve R.C.A.F., 392.
Reynolds, A.E., 208.
Rice, B, 23.
Richards, A. 241.
Richer, J.A.D.B., 250.
Riddell, W.I., 250.
Rifle Association, 282.
Rigby, T.E., 43.
Riggs, J.F., 199.
Ripley, R.C., 386.
Robb, C.A., 39, 65, 82, 109, 113.
Roberts, V.S., 249, 296.
Roberval Air Station, see Air Stations....
Rockliffe Air Station, see Air Stations-Ottawa.
Rogers, M., 62.
Rogers, W.W., 359.
Rose, R.K., 238.
Ross, A.D., 392.
Ross, A.E., 277, 300.
Ross, G.E., 231.
Royal Air Force, 1, 5, 10, 13, 21, 82, 103, 117, 166, commissions, 292, 330.

-ensign, 27.
-officers, 20.
-training Canadians, 124, 146, 166, 302, 329f, 365.
Royal Canadian Air Force, 25, 99, 115f, 164, 248.
-administration, 116, 118, 185.
-cadets, 114, 145.
-commissions, 118.
-dress, 99, 148.
-expansion, 302, 347.
-motto
-Organization Branch, 302.
-personnel strength, 100, 102, 108f, 118, 122, 125, 145, 159f, 164, 183, 209, 224, 248, 263, 278, 289, 315, 330.
-rank, 117, 125.
-rates of pay, 119.
-R.C.A.F. Photographic Establishment, 303.
-R.C.A.F. Signals Branch, 302, 307.
-regulations, 117.
-retirement, 117.
-staff, 117, 119.
-training, see Training
R.C.A.F. Active Air Force, see Active Air Force.....
R.C.A.F. Stations, 264, see Air Stations
R.C.A.F. Training Group, 303, 306, 316, 331.
-Air Armament School, 303, 316, 331.
-Air Navigation and Seaplane School, 303, 316.
-Equipment Training School, 331.
-Flying Instructors School, 386.
-Flying Training School, 303, 316, 331.
-Group Headquarters 303.
-School of Army Cooperation, 303, 316.
-Technical Training School, 303.
R.C.A.F. Units, see Air Stations
Royal Canadian Corps of Signals, 22, 74, 77, 81, 111, 124.
Royal Canadian Naval Air Service, 1, 41.
Royal Canadian Navy, 22, 139.
Royal Flying Corps, 5, 79.
Royal Military College, 87, 114, 123.
Royal Naval Staff College see Training Courses Abroad.
Runner, 82, 113.
Rutherford, W.J., 24.
Rutledge, H.H.C., 208, 236, 367.

Sadler, J.A., 185.
Saint Lawrence Seaway Project, 58.
Salaberry, B. de 76.
Sampson, F.A., 184, 337.
School of Aviation, 23.
School of Special Flying 19f, 23.
Scott, B.A., 33.
Scott, G.H., 399.
Scott, J.S., 7, 10, 16, 22, 28, 42, 44, 87f, 116, 118, 124, 140, 149, 167, 182, 190, 208, 248, 394f.
Search missions, 138, 269, 293, 318f.
Second World War
-preparation, 326.
Semple, H.C., 199.
Sharpe, N.E., 131, 307.
Shearer, A.B., 33, 45f, 79, 112, 138, 187, 225, 248, 251, 265.
Shields, T.M., 190, 214.
Shook, A.M., 7, 11, 30f.
Sifton, A.L., 5f.

Skis, 113.
Slemon, C.R., 100, 237, 244, 270, 340, 366.
Small, N.E., 249.
Smith, D.M., 250, 296.
Smith, F.R., 7, 38.
Smith, K.J.M., 321.
Smith, Sir Ross, 139.
Smith, S., 43, 65, 82.
Smither, R., 387.
Smuggling, see Preventive patrols....
Snow, A.C., 102.
Sorenson, E.W., 236, 367.
Spanish Civil War, 326.
Spradbrow, G.R., 256.
Springall, E.A., 337.
Squadrons, 23f
-C.A.F., 1f, 12.
-during W.W.1, 1f.
-R.C.A.F., 145, 183, 302, 315.
Stanley, P.G., 225.
Stedman, E.W., 8, 39, 65, 81f, 94, 98, 109, 112, 118, 139, 182, 190, 195, 205, 220, 265, 401.
Steers, F., 232.
Stevenson, H.I., 60.
Stevenson, L.F., 133, 156, 158, 215, 225, 236, 264, 290, 318.
Stewart, C.A., 177.
Stewart, R.W., 251.
Stirling, G., 300f.
Stocking fish, 63.
Stout Metal Airplane Company, 230.
Stupart, Sir Frederick, 8, 39.
Sully, J.A., 265, 340, 360.
Sutherland, D., 67f, 114, 118, 235, 246, 260, 300.
Swaine, Dr. J.M., 190, 214, 231, 256

Tackaberry, S.G., 38, 65, 166, 185, 264, 322.
Tailyour, K., 20f, 84.
Talbot, F.X., 38.
Target Practice, 102.
Taylor, H.L., 282, 337.
Taylor, L.F.J., 337.
Technical Branch, 8, 39f, 65, 81, 102, see Aeronautical Engineering
Tennant, E.C., 184, 249, 337.
Terry, N.C., 199.
Testing, 57, 109, 111.
-test flying 23, 58, 112, 160, 225.
Thomas, R.I., 249, 367, 384, 389.
Thompson, A., 2, 23, 27.
Thompson, G.A., 16, 20, 23, 35, 43, 48.
Torrie, N.C., 199.
Tough, D., 125.
Tourgis, W.S., 249, 337.
Townley, P.F., 16, 20.
"Trained in Canada Scheme" 330, 336.
Training, 185, 236, 249, 280, 295, 303, 306, 320, 335f, 362, 375.
-air gunnery, 280, 295, 321, 335, 368.
-army cooperation, 295, 335, 359.
-bombing, 295, 321, 335.
-civilian courses, 208, 224, 236.
-engineers, 295.
-explosives, 295.
-flying, 14, 20, 87, 164, 265, 295, 321, 335, 364, 386.

-flying instructors course, 208
-ground instructors course, 20, 23.
-instrument flying 236f.
-intelligence liaison 280, 295, 337.
-junior officers, 295.
-P/P/O, 121, 123, 164f, 208, 236, 249, 266, 281.
-parachute, 146, 165, 208, 224, 236.
-photography, 236, 281, 295, 336.
-pilot training (N.C.O.), 184.
-pistol, 295
-radio beacon, 296.
-refresher flying, 20, 67, 165, 208, 236.
-senior officers, 295, 337.
-service training, 124, 225, 236, 266, 280, 295, 344f, 386
-squadron armament, 295, 336, 368.
-storekeeping, 165.
-technical training, 101, 184, 224, 236, 295, 336, 365.
-Training Depot Station, 23, 87, 102.
-wireless, 165, 295.
see also: R.A.F., R.C.A.F. Training Group, Pilot Training, Training Courses Abroad.
Training Courses Abroad
-Calshot, 166.
-Central Flying School, 166, 225, 146.
-Cranwell, 166.
-Imperial College of Science, 166, 225.
-Imperial Defence College, 282.
-Old Sarum, 166.
-R.A.F. School of Air Pilotage, 225.
-R.A.F. Staff College, 87, 124, 282.
-Royal Naval Staff College, 166, 225.
Training Depot Station, 23, 87, 102.
Trans-Canada Air Pageant, 250, 402.
"Trans-Canada Trophy", 176, 399, 401.
Trans-World flights, 71, 139.
Transportation Services, 74, 104, 110
Treaty of Versailles, 326.
Treaty money flights 13f, 74, 110, 158, 269.
Trenchard, Sir Hugh, 27f, 139.
Trecarten, C.L., 184, 322, 366.
Trim, G.K., 166.
Truscott, G.G., 266.
Tudhope, J.H., 23, 72, 138, 140, 151, 164, 169, 176, 187f, 196, 397, 401.
Tupper, J.F., 24, 28.
Turnbull, G.H., 24.
Turnbull, W.R. 205.
Turner, C.B., 296, 366.
Turner, S.D., 384.
Tylee, A.K., 12, 22, 27, 35, 42, 48f, 88.

Uhlman, J.C., 242.
Unemployment Relief Project, 3, 12 see also National Defence Unemployment Relief Camp.
Uniforms, see C.A.F. - uniforms or R.A.F. - dress.

Vancouver Air Station, see Air Stations - Jericho Beach
Van Vliet, W.D., 123, 146, 165, 187, 337, 390.

Verner, J.A., 250.
Vickers Ltd. Canadian, see Canadian Vickers Ltd.
Volk, S., 249.

Wait, F.G. 225, 239, 307
Wait, G.E., 185, 251,
Wallace, Dr. R.C., 60.
Walsh, G.V., 214, 225, 264, 390.
War formations, 9, 21.
War training, 9.
Warner, A.H., 199.
Water channel, 234.
Water cooled engines, 39, 65, 113.
Watson, M.B., 16.
Weaver, W.C., 100, 187, 192, 195.
Wemp, B.S., 24.
West, F.R., 250, 296.
West, R.B., 176.
Western Air Command, 331.
Weston, J.G.W., 302, 307.
Wheeler, A.O., 73.
White, J.L.M., 24, 126.
Whitney Air Station, see Air Station...
Wilkinson, P., 282.
Williams, D.G., 366.
Williams, J.S., 16, 20, 23, 25.
Wilson, H.A., 45f, 51.
Wilson, J.A., 6, 10, 28, 38, 94, 118, 167, 182, 271, 396.
Wind tunnel, 39, 65, 68, 82, 234.
Winny, H.J., 208, 242, 249.
Wireless Communications, 8, 22, 36, 58, 72, 77, 80f, 101, 115, 124, 133, 148, 152, 200, 215, 217, 251, 368.
-training, 281, 296, 337, 368.
Wireless Stations, 46, 50, 74, 129, 148, 187, 209, 227, 251, 324
Woods, W.D., 250.
Wray, L.E., 236f, 381.
Wright, J.G., 176.
Wylie, A.H., 102, 225.

Young, H.J., 185.
Young, W., 43.

Zanni P., 140.