NOTE

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SECRET

THE ANTI-AIRCRAFT DEFENCES OF THE PACIFIC COAST

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OF THE PACIFIC COAST

1. Definition of Terms

In order to avoid confusion in the use of terms relating to Air Defence the following definitions are accepted as standard:

(a) Air Defence refers to a combination of all active means of defence against air attack, including both aircraft and anti-aircraft units.

(b) Aircraft Defence refers to defence by means of aircraft only.

(c) Anti-Aircraft Defence refers to defence by means of anti-aircraft units only.

- Army Order 91 of 1936.

2. "Fixed Coast Artillery Defences", paras 8 - 11.

3. The Report of the Joint Staff Sub-Committee on Anti-Aircraft Defences d. 16 Aug 38 listed the AA defences considered necessary on the PACIFIC Coast. Heavy AA guns in quantities commensurate with their recommendations did not reach the coast until the late summer of 1942. - HQS 7018 Vol 1.

4. HQS 20-1-12-11 (Oprs) d. 17 Jun 41, on HQS 7018 Vol 1.

5. Extracts from Chiefs of Staff Committee Memorandum, Anti-Aircraft Defence Requirements d. 28 Mar 39. para 4, on file HQS 7018, Vol 4.

6. Appendix I, Defence Scheme No 3, d. 6 Jul 38. Quoted in VS 638-1-1-1 d. 27 Jun 41 on HQS 20-1-12-11, Vol 1.

7. The additional requirements for the Mobile Force and for a training unit made the total amounts to be obtained 116 Heavy AA guns, 30 Light AA guns and 120 searchlights - Chiefs of Staff Committee Memo d. 28 Mar 39, para 4, on File HQS 7018 Vol 4.

7a. 14 4.5" Equipments were ordered Aug 38 - HQC 7506 Vol 1, d. 4 Aug 38.

8. HQS 7018 FD 9 Vol 4 d. 1 Apr 40.

9. Gen Staff Memo 24 Sep 39. HQS 7018, Vol 2.

10. GS 0126 d. 25 Nov 39, HQS 5199-C, FD 15, and Gen Staff Appreciation Defence of PACIFIC Coast d. 20 Jun 40, on HQS 8613, Vol 1.

11. Tel No 637 d. 11 Nov 39, High Commissioner to External Affairs - HQS 7018, Vol 2.

12. Chiefs of Staff Committee Memo to Minister. d. 21 Nov 39, HQS 7018 FD 3, Vol 2.

13. Tel No 443, High Commissioner to External Affairs d. 30 Sep 39. HQS 7018, Vol 2.
Tel No 54, Dominion, LONDON to External, d. 16 Jan 40. HQS 7018, Vol 2.
MGO 226, Canmilitry to Defensor, d. 1 Apr 40. HQS 7018, Vol 2.

14. On receipt of information in Sep 39 that the War Office could not promise delivery of the anti-aircraft equipment that had been ordered, the US War Department was approached. The American authorities indicated that they could supply the equivalent of the British made equipments by the fall of 1941. The

Chiefs of Staff hesitated at departing from British standards, and no order was placed with the US War Department. Draft letter Deputy Minister to External Affairs, d. 12 Dec 39, HQS 7018, FD 3, Vol 2. AUSTRALIA had been approached unsuccessfully to supply 3" 20 cwt guns - HQC 7506 Vol 1 d. 23 Feb 39.

15. CGS Appreciation for the Minister, Coast Defences - Pacific Coast, d. 7 Feb 40, HQS 5199-C, FD 15.

16. Chiefs of Staff Committee Memo to the Minister Anti-Aircraft Defence Requirements d. 28 Mar 39. Para 20, on HQS 7018, Vol 1.

17. Memo, Training of Tradesmen in the Canadian Army d. 15 Oct 41, HQ 21-0 (DTT) Vol 2.

18. An MGO memo to DMA d. 18 Mar 40 disclosed that drawings and specifications for the manufacture of Bofors guns had been cabled for - HQS 7018, Vol 4.

19. Memo re Meeting held in Room 201, House of Commons, on 25 Jun 40, on Prospective Requisitions to be Placed by Canadian Defence Departments with Department of Munitions and Supply. - HQS 7018, Vol 4.

20. Government subsidies amounting to $10,000,000. were authorized to cover initial cost of buildings, machinery and equipment, title to all of which was vested in the Crown. Guns and mountings were to be manufactured for fair and reasonable profits. - PC 3997 d. 17 Aug 40.

21. MGO Memo to DMA d. 8 Jul 40, HQS 7018 FD 175, Vol 4.

22. HQ 466-M2-11 (DOS.TS) over HQ 466-M2-15 (DOS.TS) d. 11 Mar 41, on HQS 7018, Vol 3.

23. Hon CD HOWE to Hon JL RALSTON, d. 18 Nov 41 on HQS 7506 Vol 3.

24. VATEL 2956, Min of Supply, LONDON to External Affairs, OTTAWA. d. 12 Dec 41, on HQS 7506 Vol 3.

25. DMA's report to MGO of visit to LONDON - S.8023 Vol d.29 Aug 39.

26. In his report to the MGO from LONDON the DMA wrote:
> "It seems clear that lights and sound locators will, in any event, be retained for cooperation with aircraft, but if the GL set is finally found to be foolproof, lights, height finders, and sound locators appear to be out insofar as AA shooting is concerned. - Op cit.

27. HQS 8023 Vol 1, d. 22 Aug 40.

28. One officer, Maj HE TABER, RC Sigs, and two NCOs attended a special course at the Military College of Science in Feb 40 - HQS 8023 Vol 1 d. 8 Dec 39.

29. CSC memo d. 17 Aug 40 on HQS 8023 Vol 1.

30. Minister of Inter-Service Committee d. 21 Aug 40 on HQS 8023, Vol 1.

31. 40 GL Mk III Sets were ordered 7 Jan 41, and the order was increased to 51 a year later, to allow for one set for each of the 45 gun sections (180 guns) on the ultimate scale, plus six sets for training purposes - HQS 8023 FD 30 Vol 4 d.22 Jan 42.

32. The ultimate scale allotment of AASLs to the Pacific Coast in August 1940 was ESQUIMALT 12, NEW WESTMINSTER 6, VANCOUVER 6, PRINCE RUPERT 6. HQS 7018 FD 9 Vol 4 d. 12 Feb 41.

33. GS 2221 "Troopers advise lights not successful with AA guns, but trends towards Air Fighting Zone illuminated for indication purposes to our fighters. This would site lights 6,000 yards instead of 3,500 yards apart." HQS 7018 Vol 4, d. 25 Oct 41.

34. HQS 7018 Vol 4 d. 28 Aug 41.

35. The five fighter zones in CANADA were ST JOHN's - TOR BAY, GANDER LAKE, HALIFAX, ESQUIMALT and ARVIDA. Approved by CGS 29 Oct 41, on HQS 7018 Vol 4.

36. Of the 37 modern lights 25 were 60" manufactured by Canadian General Electric; 11 were Sperry 60", made in USA; and one was a British 150 cm model supplied as a pattern by the War Office. The obsolescent lights were 120 cm equipments. HQS 7018 Vol 4 d. 12 Feb 41.

37. In mid-November 1941 the Joint Services Committee, Pacific Coast, urged that the number of Bofors guns allotted for defence against low-flying aircraft at other than Advanced Air Bases be doubled, or that the existing allocation be revised to give protection to the important industrial area of VANCOUVER - VS 638-2-1-1 d. 18 Nov 41, on HQS 7018 Vol 5.

38. But as late as 3 Dec 41 the first 24 Bofors guns produced, whose retention in CANADA had been agreed to by the War Office, were all allotted to the Atlantic Coast. At the same time allotments of the first 32 3.7" AA guns to be delivered in CANADA sent only 4 to the West Coast. - DMO&I memo to CGS HQS 7018 FD 23 Vol 5 d. 3 Dec 41.

39. Vide para 11 above.

40. HQS 7018 Vol 4 d. 21 Oct 41.

41. MD 11 DAAG letter PC 602-3-A-2 d. 6 Oct 41, and HQ V&E Fortress letter F/5-1 d. 5 Dec 41.

42. Article - Civilian Protection in BRITISH COLUMBIA by Russell UNDERHILL, VANCOUVER, d. 20 May 42, supplied by Advisory Council, Provincial Civilian Protection Committee.

43. (i) DMO&I memo to CGS d. 26 Dec 41 on HQS 7018 FD 20 (Ops) Vol.5
(ii) GOC-in-C, Pac Comd VS 602-3-A -2 d. 3 Jan 42.

44. DAAG MD No 11 auth 602-3-A-2 d. 6 Oct 41.

45. HQ MD No 6 Administrative Order No 93 d. 10 Jan 42.

46. DAAG MD 11 602-3-8-1 d. 2 Mar 42.

47. War Diary, 2 AA Bty RCA d. 27 Dec 41.

48. Pac Comd Gen Staff Letter VS 602-3-A-2 d. 25 Feb 42.

49. HQS 8704-1 FD 7 (Opns) d. 11 Dec 41. The significance of the name "Shrapnel" Section was never clearly apparent. It may have originated in the fact that the organization of the sections closely paralleled the Beach Defence Section manning 18-pdr guns. Vide Rules for Calculating RCA Garrisons at Defended Ports, quoted in GOC-in-C letter VS 638-1-1-10 d. 11 Feb 42, Appendix 99 to War Diary, PACIFIC Command, Vol 15.

50. Vide para 7 above.

51. HQS 7018 FD 116 MR 1 d. 5 Jun 42.

52. Two Bofors were in action at ESQUIMALT Dry Dock and the RCN Playing Field. The remaining AA armament was at PATRICIA BAY - PACIFIC Command Progress Report d. 11 Feb 42 on HQS 8538-10 Vol 1.

53. War Diary, 2 AA Bty RCA, d. 25 Feb 42.

54. DSD memo d. 20 Feb 42 on HQS 8704-1 FD 18 mobilization of these AA units was promulgated in GO 97 d. 24 Mar 42.

55. GO 181 d. 21 May 42.

56. Weekly Summary (Army) d. 17 Apr 42.
Authorized AA units to be expanded by conversion:-

	From	To
9 AA Bty	H	2H
21 AA Bty	H	2H
13 AA Bty	2L	3L
10 AA Tp	L	2L
11 AA Tp	L	2L
31 AA Tp	L	3L
32 AA Tp	L	2L
33 AA Tp	L	2L
34 AA Tp	L	2L

57. Anti-Aircraft Defences - CANADA and NEWFOUNDLAND. Ultimate Scale, 16 Mar 42 Table 1B West Fol 29 HQS 7018 FD 61 Vol 10.

58. "Additional AA Units required for AA Defences CANADA, NEWFOUNDLAND and LABRADOR". Appendix to CGS memo to Minister d. 12 Feb 42 on HQS 7018 FD 35 (DSD).

59. CGS Memo to Minister d. 12 Feb 42 on HQS 7018 FD 35 (DSD).

60. CGS letter to GOC-in-C PAC Comd d. 11 Feb 42, HQS 7018 FD 35(SD1).

61. GOC-in-C Pac Comd letter
(i) VS 638-2-1-1 d. 17 Feb 42, on HQS 7018 Vol 5
(ii) VS 638-2-3-1 d. 28 Feb 42 on HQS 7018 Vol 6

62. Appendix "A" issued with HQS 7018 FD 52 MR 1 d. 24 Apr 42 shows the following distribution from Training Centres to units.

From	To	9 AA Bty	22 AA Bty	13 AA Bty	10 AA Bty	11 AA Bty	32 AA Bty	Total
A1	(PETAWAWA)	10	10	10	9	4	40	83
A2	(PETAWAWA)	22	17	22	22	21	22	126
A3	(SHILO)	14	14					28
A4	(BRANDON)	48	9	9	9	9	9	94
A23	(HALIFAX)	44	41	41	41	21	59	247
	TOTALS:	138	91	82	81	55	130	577

63 DM&R memo to DAG (A) HQS 7018 FD 76 MR 1 d. 7 May 42.

64. DCGS(A) Memo to DAG, HQS 7018 FD 76 d. 30 Apr 42.
See also Pac Comd GS Memo to Col Fixed Defences, PCS 504-3-7 (GS)

64. (Cont'd.) d. 16 Jul 42 referring to the arrival at the CAS of 1 of 500 untrained men during each of August, September, October and November. (War Diary, Pac Comd. Vol 20 Appx 205).

65. The 32 AA Bty (Type 2L) on arrival in PRINCE RUPERT a month after concentration took on strength 52 recruits from the Edmonton Fusiliers, with only 30 days, infantry basic training - War Diary, 32 AA Bty, d. 10 Jun 42.

66. War Diary - A24 C&AA Arty TC d. 10 Jan 42.

67. CGS letter to GOC-in-C PACIFIC Command HQ 54-27-20-724 FD 2 (Trg) d. 11 Oct 41.

68. GOC-in-C (Lt Gen-STUART) letter PC 5502-3-9 (Arty) d. 22 Jun 42 - War Diary Pac Comd Vol 19 Appx 221.

69. War Diary CAS of 1 Aug 42.

70. Ibid. Entries for 7 Aug 42, 10 Sep 42, 21 Oct 42, 20 Nov 42, 5 Dec 42.

71. CGS Memo to Minister, d 22 May 42. HQS 7018 FD 61, Vol 10.

72. Auth GO 256 d. 2 Jul 42.

73. DMO&I to GOC-in-C Pac Comd d. 31 Mar 42 HQS 7018 FD 61, Vol 10.

74. The new officer Commanding, Lt-Col RA GOUDEY and the new Regimental Sergeant Major, RSM McHARG DC, had been the first two qualified Bofors instructors in Pacific Command.

75. War Diary, 42 AA Bty RCA d. 2 Jul 42.

76. Ibid d. 10 Nov 42.

77. Ibid d. 18 Apr 43.

78. Ibid d. 4 Aug 43.

79. For a list of the ultimate 16 LAA gun sites at VICTORIA-ESQUIMALT see DGAA Tour Notes, 7-11 Feb 44, Maj-Gen SCM ARCHIBALD DGAA on Narrator's file 2-4-0.

80. The 9 AA Bty absorbed No 3 Sec 1 AA Bty who manned the first two 3.7" guns. Two more were mounted in April, and the remaining four in October 1942. - War Diary HQ 27 AA Regt RCA d. 31 Oct 42.

81. The gun density of any point within a vulnerable area refers to the number of guns that can cover that particular point with their fire. After an inspection of the AA gun sites in the VICTORIA-ESQUIMALT area by Col LK LOCKHART MC, British Army Staff, i/c AA Work at WASHINGTON, Lieut-Gen K STUART, then GOC-in-C Pacific Command, recommended that addition of four more Bofors to PATRICIA BAY Air Station, to increase the protection from a two-gun density to a four-gun density. - PCS 508-2-1-15 over PCS 503-1-2-9 (ARTY) d. 2 Jul 42. Appendix to War Diary, Pacific Command Vol 20 July 1942.

82. War Diary, No 1 AA (MG) Tp RCA d 14 May 43. Also HQS 8538-10 Vol 2. Progress Report d 3 Jul 42.

83. PCS 504-3-1 d 23 Jun 42. War Diary, Pacific Command Vol 19, Appx 238.

84. War Diary, 11 AA Bty d. 13 Jun 42.

85. War Diary, 31 AA Bty d 23 May 42.

86. War Diary, 28 AA Regt July 1942.

87. Unnumbered Tele: Administration Pacific to Defensor d 19 Aug 42. HQS 20-1-12-11 Vol 2 Fol 84.

88. DMO&P Memo to CGS d 22 Aug 42. HQS 20-1-12-11 Vol 2 Fol 87.

89. Progress Report - Coast & AA Defences d 5 May 43, Appx B - HQS 8538-10 Vol 3.

90. War Diary, 31 AA Bty d 3 Jul 42.

91. (i) See 88 above
(ii) Authority for conversion and redesignation of 11 AA Bty was given on HQS 20-1-12-11 Vol 2 fol 92 d 28 Aug 42.

92. (i) War Diary, 11 AA Bty d 13 Oct 42.
(ii) War Diary, 31 AA Bty d 7 Oct 42.

93. War Establishment Cdn V/1940/327T/1.

94. War Diary 58 Spec AA Bty d 17 Aug 42.

95. MOB 512 HQS 7018 FD 116 MR 1 d 5 Jun 42.

96. War Diary 58 Spec AA Bty 4 Dec 42.

97. HQ Pac Comd. Disbandment Order - V 602-3-A-58 (D2) d 8 Jul 43.

98. War Diary 32 AA Bty RCA d 10 Jun 42.

99. War Diary 112 LAA Bty, d 29 Apr 42 & 31 May 42.

100. Ibid d 22 Jul 42.

101. Ibid d 27 Jul 42.

102. Ibid d 16 Sep 42.

103. HQS 20-13-12-14 FD 13 d 19 Jul 42.

104. HQS 7018 FD 201 (Oprs) d 23 Jan 43.
See also Extract from Military Reports on the United Nations No.2 d 15 Jan 43, Military Intelligence Service War Dept USA, on HQS 7018 Vol 13 d 23 Jan 43.

105. (i) HQS 7018 FD 224 (Oprs) Vol 13 fol 220 d 23 Mar 43.
(ii) HQS 7018 FD 224 Vol 13 fol 242 d 17 May 43.

106. War Diary 22 HAA Bty (Mob) RCA d 13 May 43.

107. War Diary 23 AA Bty RCA d 18 Apr 43.

108. War Diary 44 AA Bty RCA d 18 Jul 43. The allocation of the 44 AA Bty to PRINCE RUPERT followed an earlier proposal to disband the battery on its removal from the PORT HARDY assignment and to absorb its personnel into the expanded 23 AA Bty. See "Proposed Reorganization of Units to Implement Revised AA Plan", Appx D to HQS 7018 FD 224 Oprs Vol 13 fol 211 d 23 Mar 43.

109. HQS 20-4-12-B, FD 2 (Mob 1c) d 26 Jun 43. The original regimental grouping included the 79 AA Bty (2L) assigned to TERRACE but the battery was disbanded in October, never coming under command of the 29 AA Regt.

110. "History of the 29th AA Regiment RCA CA, supplied to the narrator by Lt-Col GF PAULIN, ED. On narrator's file 2-4-0-29R, d 24 Feb 44.

111. War Diary 22 HAA Bty RCA d 9 Mar 43.

112. War Diary 44 AA Bty RCA d 18 Jul 43.

113. Progress Report d 7 Sep 43. HQS 8538-10 Vol 3.

114. General Staff Oprs 166-G, Appx C d 23 Mar 43. HQS 7018 FD 224 (oprs) Vol 13 fol 215.

115. Conversion of 32 AA Bty Type 2L to 3L. HQS 20-4-12-B,FD 2,Mob 1c d 26 Jun 43.

116. "Report of Meeting held at Headquarters; 13th Naval District SEATTLE at 1000 hours, Friday, 6 March, 1942" - VS 638-1-1-5 Appx to War Diary, PACIFIC Command Vol 16 Mar 42.

117. (i) RCAF War Diary - 115 Squadron d 27 Apr 42.
(ii) RCAF War Diary - 118 Squadron d 29 Jun 42.

118. War Diary - 112 LAA Bty RCA d 22 Jul 42 & 18 Aug 42.

119. Accommodation - 112 LAA Bty RCA - Pac Comd Letter to OC PRINCE RUPERT Defences 508-2-3-15 (GS) d 11 Jul 42. Appx 132 to War Diary, Pacific Command Vol 20, Jul 42.

120. War Diary 112 LAA Bty RCA d 30 Aug 42.

121. Letter of commendation from Lt-Col Ellis G CHRISTENSEN, Commanding HQ, ANNETTE ISLAND Landing Field, d 12 Sep 42, War Diary 112 LAA Bty, Appx C, Vol 12.

122. (i) War Diary 34 AA Bty RCA d 11 Sep 42.
(ii) War Diary 22 AA Bty RCA d 11 Sep 42.

123. DMO&P memo to CGS. HQS 20-1-12-11 FD 19 (Oprs) Vol 2 d 27 Jul 42.

124. War Diary 34 AA Bty RCA d 1 Sep 42.

125. An annual rainfall of 220" with continuous gales of 60 - 90 mph were reported to the Narrator by Capt TS MAUNSELL, Bty Capt 34 AA Bty. File 2-4-0-34 d 23 Mar 44.

126. War Diary 22 HAA Bty RCA d 9 Mar 43, 11 May 43 and 14 May 43.

127. Letter GOC-in-C Pac Comd to NDHQ. Transfer of 31 AA Bty RCA from ANNETTE IS to TERRACE, PCS 50-1-1-1 (GS) undated. Narrator's file 2-4-0-31.

128. War Diary 29 AA Regt RCA d 6 Oct 43.

129. Ibid d 30 Nov 43.

130. PC 7995 d 4 Sep 42 quoted in HQS 20-4-12-11 Vol 1.

131. (i) Pac Comd Organization Order V 602-3-AAT-62 d 1 Apr 43.
(ii) HQS 7018 FD 208 Vol 13 fol 186. The CS Cttee reduced the recommended size of the battery from 8 to 6 guns.

132. (i) Report on Trip by Maj-Gen GR PEARKES GOC-in-C Pac Comd in connection with official Opening of ALASKA - CANADA Highway. PCC 415-1-1 (GOC) d 26 Nov 42. Pac Comd War Diary Vol 24 Appx 3-26.
(ii) JSC (West Coast)Recommendation, PCS 508-1-1-4-22 d 21 Dec 42, on HQS 7018 Vol 13 fol 188.

133. GO 430 d 26 Oct 43. HQS 8783 (Org A1A) d 3 Nov 43.

134. Permanent Joint Board of Defence Journal, Vol 1 d 4 Oct 40.

135. Ibid Vol 1 d 15 Nov 40.

136. Operation Instructions by GS Pac Comd. PCS 508-1-4-3 d 3 Jul 42. Appx to War Diary, Pac Comd, Vol 20, July 42.

137. RCAF Progress Report for 1 Sep 42 Meeting of Permanent Joint Board of Defence - PJBD Journal Vol 3 d 29 Aug 42.

138. (i) War Diary - 30 LAA Bty RCA d 12 Jun 42.
(ii) HQS 8538-10 Vol 2 Appx B to Prog Report d 4 Sep 42 shows the 30 LAA Bty manning 6 of its own Bofors and 2 of the 33 AA Bty guns at TOFINO.

139. (i) War Diary 23 AA Bty RCA d 31 Oct 42.
(ii) Ibid d 3 Jun 43.

140. Pac Comd Organization Order V 602-3-AR-30 d 8 Jul 43.

141. The original regimental grouping included the 36 AA Tp (Type L) assigned to COMOX but COMOX never received AA defence, and the troop was disbanded in Dec 43.

142. MOB 805, HQS 20-4-12-11 FD 6 (MR1) Vol 2 d 14 Sep 42.

143. War Diary 59 AA Bty RCA d 16 Oct 43 and 18 Dec 43.

144. HQS 20-4-12-1 (Org A1C) d 15 Oct 43.

145. PACIFIC Command Operation Instruction No. 101. PCS 508-1-1-1 d 18 Oct 43. Appx to War Diary General Staff Pacific Command, d 18 Oct 43.

146. Letter OC 30 AA Regt RCA to Col Fixed Defences Pac Comd. 30 AA - CO (Conf) d 23 Oct 43. Narrator's file 2-4-0-30 R.

147. HQS 20-4-12-11-B FD 7 (Org A1C) d 21 Dec 43.

148. The Ultimate Scale of Bofors for Pacific Command as revised 16 Mar 42 showed allotments of guns for CD Batteries as follows: VICTORIA-ESQUIMALT 6, VANCOUVER 2, YORKE ISLAND 2, PRINCE RUPERT 4. - Oprs 143, HQS 7018 FD 52 (Oprs) d 18 Mar 42.

149. E.g. WE for 55 Coast Bty RCA Cdn V/324E/1 d Sep 41.

150. The GOC-in-C's (Maj-Gen RO ALEXANDER) recommendation for the provision of AA LMGs for outlying CASL detachments made in Sep 41 were at first not approved for the following reasons:-
(1) Camouflage hides DEL positions in day time.
(2) At night, planes fly high out of range of AA LMGs.
(3) Lewis guns were needed for ATLANTIC convoys.
- WC 858-1-8-13 Vol 3 d 29 Sep 41, on HQS 20-1-12-11 Vol 1.
But a repetition of the request on 20 Dec 41, "in view of changed conditions, brought approval of an issue of 9 Brens for 5 (BC) Cst Regt and 3 for 15 (Van) Cst Regt - HQS 20-1-12-11 Vol 1 d 27 Dec 41.

151. W.E. for 55 Coast Bty RCA Cdn V/324E/2 d 1 May 42; for 56 Coast Bty RCA Cdn V/324F/1 d 1 May 42 etc.

152. WE for 58 Coast Bty RCA, Cdn V/1940/324H/2 d 1 Jun 42 page 4 note (a).

153. Footnote "A" to the establishments provided that personnel for the AA sections were not to be provided until authorized by NDHQ. On 29 Jul 42 the GOC-in-C (Lt-Gen K STUART) recommended immediate authorization of sections, so that personnel could be trained to man the guns. - PCS 508-2-1-3 (ARTY) d 29 Jul 42, on Narrator's file 2-4-0.

154. Appx B to Progress Report HQS 8538-10 Vol 2 d 4 Sep 42.

155. War Diary 30 LAA Bty RCA d 12 Jun 42, 22 Jun 42 and 24 Jun 42.

156. HQS 7018 FD 224 Oprs d 23 Mar 43, Appx C Vol 13 fol 215.

157. HQS 20-1-12-B FD 4 SD1-957 d 22 Jun 43.

158. AA Progress Report 3 Oct 42 showed completion of issue of Bofors guns for the Coast Artillery batteries of the VICTORIA-ESQUIMALT area. - HQS 8358-10, Vol 2 d 3 Oct 42.

159. AA Progress Report HQS 8358-10, Vol 2 d 18 Nov 42. The new AA secs formed part of the following coastal batteries:- 9 Cst Bty, FAIRVIEW PT (PRINCE RUPERT); 102 Cst Bty, BARRETT PT (PRINCE RUPERT); 55 Cst Bty, MARY HILL (V-E); 56 Cst Bty, ALBERT HD (V-E); 68 Cst Bty, CHRISTOPHER PT (V-E); 85 Cst Bty, YORKE ISLAND.

160. Light AA sections were deleted from the establishments of the 9, 55, 56, 68, 85 and 102 Cst Btys in Dec 43.

161. A comment made on more than one occasion to the Narrator during the course of his visits to Coast Artillery Batteries in Pacific Command, in February 1944.

162. HQS 20-5, MR 1 Appx A d 8 Jun 42.

163. War Diary - 9 Lt. AA Regt RCA d 2-5 Jan 43.

164. Ibid d 2 Mar 43.

165. Pac Comd 602-3-LAR-9 d 16 Mar 43. Narrators file 2-4-0-9R.

166. GO 251/43 d 15 May 43.

167. War Diary 9 Lt. AA Regt RCA d 25 Jun 43.

168. Pac Comd 602-3-A-79 (D2) d 13 Oct 43.

169. 13 Cdn Inf Bde Operation Order No 1 d 2 Sep 43. War Diary, HQ 13 Cdn Inf Bde Sep 43 Appx II.

170. HQS 20-4-5-B FD 12 (ORG A1C) d 19 Nov 43.

171. (i) Interview with Lieut WOODS A/Adj 28 AA Regt RCA at VANCOUVER, 3 Feb 44. Other heavy AA batteries.
(ii) The other heavy AA batteries in the Command were manning gunsites at the end of 1943 as follows:-

2 AA Bty (Type H) - ESQUIMALT (Tillicum Rd)
23 AA Bty (Type 2H) - ESQUIMALT (Macaulay & Colwood)
22 AA Bty (Type 2H) - PATRICIA BAY (Wilson Rd & Bazan Bay)
44 AA Bty (Type H) - PR RUPERT (Pillsbury Cove)
9 AA Bty (Type 2H) - PR RUPERT (11 Ave & Tobey Pt)

- Monthly Prog Report HQS 8538-10 Vol 3 d 7 Dec 43, and War Diaries 27, 28 and 29 AA Regts RCA, Dec 43.

172. Distribution of the AA batteries manning Bofors in the Command at the end of 1943 was as follows:-

34 AA Bty (Type 2L)
& 1 Tp of 31 AA Bty BOUNDARY BAY
32 AA Bty (Type 3L) SEA ISLAND
13 AA Bty (Type 4L less 2 sub-secs) ESQUIMALT
10 AA Bty (Type 3L) PATRICIA BAY

172. (Cont'd)

11 AA Bty (Type 4L)*	PRINCE RUPERT & ALLIFORD BAY
33 AA Bty (Type 4L)	TOFINO & UCLUELET
59 AA Bty (Type 3L)*	PORT HARDY & BELLA BELLA

* The 11 AA Bty had been increased from Type 3L to 4L to absorb the 35 AA Tp (Type L) at ALLIFORD BAY. The 59 AA Bty returned from Type 2L to 3L on absorbing the 36 AA Tp (Type L) at BELLA BELLA.
- Monthly Prog Report HQS 8538-10 Vol 3 d 7 Dec 43.

173. DGAA to DMO&P HQS 8538-10 FD 11 Vol 3 d 13 Oct 43.

174. Monthly Prog Report HQS 8538-10 Vol 3 d 7 Dec 43.

175. Monthly Prog Report

176. The Stiffkey Stick's ratio of efficiency in comparison with the Kerrison Predictor has been unofficially suggested by experts as being two to five. - HQS 7018 FD 120 (DSD 5) Vol 10 fol 111, d 17 Jun 42.

177. Monthly Prog Report. HQS 8538-10 Vol 3 (on Vol 7) d 20 May 44.

178. HQS 70-5-326B (PC 46/6755 of 31 Jul 42).

179. HQS 20-1-12-13-B M831 d 7 Oct 42.

180. HQS 20-4-12-B FD 2 (Mob 1c) d 26 Jun 43.

181. Duties of a GDO, Memo DGAA to D Pers. HQS 20-4-12-B(DGAA) d 11 Dec 43.

182. HQS 20-1-12 Org MR (6) d 1 Oct 41.

183. War Diary 4 AA S/L Bty RCA. March 1942.

184. WE Cdn V/1940/328S/1.

185. GO 301 d 15 Jun 43, HQS 20-4-12-B fol 71.

186. War Diary 4 AA S/L Bty RCA d 30 Apr 42.

187. AA Accommodation, 27 AA Regt RCA. PCS 510-1-2 (ARTY) d 23 Jul 42. War Diary Pac Comd Appx 286, Jul 42.

188. (i) War Diary 28 AA Regt RCA d 30 Sep 42.
(ii) Semi-Monthly Prog Report. HQS 8538-10, Vol 2 d 15 Dec 42.

189. War Diary 28 AA Regt RCA d 30 Sep 42.

190. Morale Report by Chaplain 15 (Van) Coast Regt RCA d 30 Oct 42 - War Diary 28 AA Regt RCA Appx 7, Oct 42.

191. 30 LAA Bty Report to Pac Comd GS d 8 Jul 42. - War Diary 30 LAA Bty RCA Appx 8, Jul 42.

192. Semi-Monthly Progress Report HQS 8538-10 Vol 3 d 31 Mar 43.

193. History of the 29 AA Regt RCA - Lt-Col GF PAULIN. Narrator's file 2-4-0-29R.

194. Semi-Monthly Progress Report HQS 8538-10 Vol 3 d 31 Dec 43.

195. War Diary 29 AA Regt RCA d 15 Dec 43.

196. War Diary 29 AA Regt RCA d 25 Jan 44.

197. War Diary 34 AA Bty RCA d 4 Mar 43.

198. PCS 502-3-3 (ARTY) d 7 Aug 43.

199. PCS 502-3-3 (ARTY) d 23 Aug 43.

200. CGS Memo to Minister, HQS 20-1 FD 110 d 30 Aug 43.

201. HQS 20-1-12-B FD 16 SD 1-1153 d 2 Oct 43 Appx A&B. In PACIFIC Command AA units affected were 6 Batteries Type 2H, 2 Type H, 1 Type 4L, 1 Type 4L less 2 sub-sections, 4 Type 3L, and 1 Type 2L.

202. Circular Letter M 199 HQS 20-4-12-B (Org Alc) d 18 Nov 43. The reorganized establishments gave No 2 AA GOR VICTORIA and No 6 AA GOR VANCOUVER 6 offrs and 34 ORs; and No 9 AA GOR PRINCE RUPERT, 4 and 31.

203. HQS 7018 FD 242 (Oprs) d 11 Oct 43.

204. Interview with Maj-Gen GR PEARKES GOC-in-C Pac Comd d 21 Mar 44. Narrator's file 6-1-P-2.

205. Monthly Report, Operational State, AA Defences. HQS 8538-8 V 4 Oprs d 25 Jul 44 on HQS 8538-10 Vol 7.

SECRET

THE ANTI-AIRCRAFT DEFENCES OF THE PACIFIC COAST

THE PROBLEM OF EQUIPMENT

I PROVIDING THE TOOLS

1. In none of the three phases of the development of Pacific Coast defences, ground troops, coastal artillery, and anti-aircraft artillery, did lack of equipment prove so significant a factor as in that of the anti-aircraft defences (1). The story of the evolution of Canadian anti-aircraft defences on the West Coast is largely the story of the efforts of the General Staff to meet the limitations imposed upon their policy by the difficulty, for long an impossibility, of obtaining the necessary tools of war. The fixed coastal artillery defences at the beginning of the Second World War, while falling short of the realization of the intended ultimate scale, had nevertheless, under an interim plan of making use of existing armament, attained a degree of preparedness that afforded a satisfactory measure of protection (2). But of existing effective anti-aircraft armament in 1939 there was none, and from the time that Pacific Coast requirements were first voiced by the General Staff four years were to elapse before supply of equipment in appreciable amounts was to commence (3).

PRE-WAR PLANNING

2. On 16 Aug 38 the Joint Staff Sub-Committee on Anti-Aircraft Defence presented a comprehensive report which drew attention to the needs for Active Anti-Aircraft Defence in CANADA, stressed the complete inadequacy of the means presently available, and recommended the provision of certain equipments considered the minimum requirements in the light of existing forms and scales of air attack (4). The report formed the basis for a memorandum on Anti-Aircraft Defence Requirements, issued by the Chiefs of Staff Committee on 28 Mar 39.

3. In the view of the Committee air attacks on CANADA would have two main purposes:- to effect material damage on targets whose destruction or impairment might be expected to have a direct and appreciable strategic or economic effect on the conduct of the war, and to carry out sporadic bombing on large centres of population, with the purpose of inducing public demand for protection to cause the immobilization of disproportionate naval, land and air forces in a purely defensive role (5). On the Pacific Coast the points considered subject to air attack were ESQUIMALT-VICTORIA, VANCOUVER, NEW WESTMINSTER and PRINCE RUPERT. The anticipated Forms and Scales of Attack (as laid down in Defence Scheme No. 3) were given as, "definite risk of torpedo, bomb or gas attack by a maximum of twelve aircraft from enemy cruisers, armed merchant vessels or improvised carriers" (6).

EARLY REQUIREMENTS IN ARMAMENT

4. It was recognized by the committee that the best active defence against air attack was a judicious combination of the employment of fighter and bomber aircraft and anti-aircraft artillery and smaller weapons on the ground, with the assistance at night of search-lights and sound locators. The main

type of AA armament to be provided was the 3.7" or the 3" 20-cwt high angle gun. For the protection of a single vulnerable point such as a drydock or an arsenal a minimum of four guns would be required, and at the more important of the centres subject to air attack the minimum necessary to provide a reasonable deterrent was considered a complete battery of eight guns.

5. The heavy type of anti-aircraft gun was not designed to deal with attacks at heights of less than 4,000 feet, and such light automatic weapons as the Lewis or Bren were not regarded as effective against modern aircraft at heights much above 500 feet. Light anti-aircraft guns (the 40-mm Bofors, or the Vickers 2-pdr twin) were therefore considered necessary for the protection of important targets against low-flying attacks. The extent to which, even as late as the spring of 1939, General Staff planning was influenced by considerations of the cost of equipment is shown in the admission that "the first and, perhaps, most important principle" that guided the recommendation for provision of light anti-aircraft guns for static defence was that of economy. With the cost of a Bofors estimated at $29,600, without fire-control equipment, financial means available restricted the provision of such guns to only four centres in CANADA, - HALIFAX, ESQUIMALT, SYDNEY and SAINT JOHN. The first three cities would receive four light AA guns; SAINT JOHN was allotted two.

6. The economy factor played a significant part too in fixing the requirements in anti-aircraft searchlights for the defence of centres subject to air attack. The speed of modern aircraft implied the provision of a large number of searchlights, no less than two complete batteries (48 lights) being considered necessary for the defence of certain vulnerable areas. But a single battery of 24 lights with its quota of sound locators was estimated to cost $600,000, with further substantial expenditures incurred in the work of installation. The financial outlay necessary to equip with lights on this scale all centres considered vulnerable to air attack appeared prohibitive. But it was not considered advisable to dispense with searchlights altogether, as such a course would lay each centre open to unopposed night attack and deliberate bombing at low altitudes. A compromise was reached. It was decided that the provision of a single troop of six lights at each vulnerable point would provide a useful deterrent against hostile aircraft attacking at night with impunity, and that the morale of the inhabitants would be favourably affected by such provision.

7. Based upon the report of the Joint Staff Sub-Committee the Chiefs of Staff Committee recommended, in March 1939, that the following AA defence requirements be provided for on the West Coast:-

	Heavy AA Guns	Light AA Guns	AA Searchlights
ESQUIMALT-VICTORIA	8	4	6
VANCOUVER	8	-	6
NEW WESTMINSTER	4	-	6
PRINCE RUPERT	4	-	6

The total minimum requirements listed at the same time for the defence of all coastal and inland centres in CANADA exposed to air attack were 84 heavy AA guns, 14 light AA guns, and 66 searchlights. Sound locators were required on the same scale as searchlights. Additional equipments would have to be acquired for the Mobile Force and for training purposes (7).

EQUIPMENT ORDERED FROM WAR OFFICE

8. Towards the fulfilment of these requirements, disregarding some old guns of Great War pattern so obsolete as to be of negligible defensive value, CANADA had, six months before war broke out with GERMANY, only four 3" 20-cwt AA guns. As replacement for 3" 20-cwt and 4.5" equipments previously ordered from the War Office but whose manufacture had been discontinued, orders had just been placed (March 1939) for 18 - 3.7" guns complete with fire control apparatus (7a).

9. HITLER was on the march in EUROPE, and the threat of war was becoming more and more imminent. On the ATLANTIC Coast particularly the lack of anti-aircraft defences was a matter of grave concern. The Chiefs of Staff recommended that 84 additional 3.7" equipments and 30 Bofors guns be purchased, but a year was to elapse before any further orders were placed. In April, 1940, an order for 38 - 3.7" equipments was placed with the War Office. The provision of these guns, together with the modern equipments already in the country and those due from the 1939 order, was considered "essentially necessary to complete the Anti-Aircraft defences of the East and West Coasts" (8). At the same time the first light anti-aircraft artillery for CANADA was ordered, when requisitions for fourteen semi-mobile 40 mm Bofors were placed with the War Office. It would seem as though planning for Canadian Anti-Aircraft defence must now mark time for a while.

10. War came, and found the ATLANTIC Coast with four 3" 20-cwt guns of modern design in place at HALIFAX. The remaining anti-aircraft defences in CANADA consisted of eight 13-pdr 9-cwt AA guns, obsolete since 1920, with 307 rounds out of a full scale of 8,000 rounds of ammunition, and two 4" AA naval guns whose defensive value was purely nominal as they had no modern fire-control equipment (9). The PACIFIC Coast's allotment of this equipment was two of the 13-pdrs, with no ammunition (10).

11. In the emergency every effort was made to hasten the delivery of some of the equipment ordered from the War Office earlier in the year. But BRITAIN'S own needs in anti-aircraft defences were imperative. Every gun that could be produced was needed to meet the threat of the LUFTWAFFE. It was only after urgent representations had been made in LONDON through Brig HDG CRERAR, then BGS at CMHQ, that four of the new 3.7" AA guns were released to CANADA in November (11). The ATLANTIC seaboard was regarded as far more vulnerable to air attack than the PACIFIC Coast. The importance of HALIFAX as a convoy assembly point was recognized, and the new armament was allotted to HALIFAX Fortress (12).

12. No further shipment of anti-aircraft guns came from BRITAIN[x]. Nor could the UNITED KINGDOM, hard pressed as she was by the increasing tempo of GERMANY'S air attacks, offer any firm forecast of delivery of the balance of the equipment ordered by CANADA (13). The prospect for the defence of both coasts was most disturbing. There seemed to be nothing that the General Staff could do to remedy the situation. In February 1940 the CGS, Maj-Gen TV ANDERSON, in reporting to the Minister the state of the PACIFIC Coast defences wrote:

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[x] But GS 0756 d. 9 Nov 41 and GS 0773 d. 15 Nov 41 (HQS 7018 Vol. 4 Oprs.) report the arrival of two 3.7" AA guns from UK. These were (apparently) the two mobile 3.7s taken to the West Coast by No. 3 Sec. 1 AA Bty on 11 Jan 42. (See para. 26 below, and footnote)

"The second serious defect in our PACIFIC defences is the total lack of modern anti-aircraft armament for the protection of any of the PACIFIC Coast ports. In this case also, we cannot forecast when it will be possible to obtain this armament. We have no facilities to manufacture it, and GREAT BRITAIN, which is exposed to air attack on a scale far in excess of anything we need anticipate in CANADA, is naturally reluctant to release any more anti-aircraft guns to us at this time. Other sources of supply are uncertain (14), and again it would seem that the defect must persist for some time, no matter what steps we may now take to correct it" (15).

ANTI-AIRCRAFT ORDERS PLACED IN CANADA

13. It was true that in the early part of 1940 CANADA had no facilities for manufacturing anti-aircraft armament. Consideration had been given in 1938 to setting up in the Dominion an industry for such manufacture, but the estimated requirement in guns at that time was too small to warrant such an undertaking, unless requisition could be received to supply other parts of the Empire (16). The years immediately preceding the outbreak of war had seen a flow of Canadian artisans to the armament factories of GREAT BRITAIN, and the cream of her skilled tradesmen were no longer available to CANADA (17). But the possibility of manufacturing AA armament in this country was still under consideration (18), and the impasse that had been met in all attempts to obtain equipment elsewhere demanded the taking of definite action.

14. In June 1940 a decision was reached to manufacture 3.7" AA guns and 40 mm Bofors guns in CANADA (19). Financed from public funds plants were built and equipped, to be operated for the government under the management of existing industrial firms. Production of guns commenced both for CANADA and the UNITED KINGDOM. Initial orders for 200 - 3.7" equipments were placed with the CANADIAN WESTINGHOUSE COMPANY, the mobile mountings to be manufactured by the Canadian General Electric Company (20). 106 - 40-mm Bofors equipments were ordered from the Otis-Fensom Elevator Company (21).

15. It was estimated that deliveries from the production line would commence in the late summer of the following year. No anti-aircraft armament beyond the four guns shipped in November 1939 had been received from GREAT BRITAIN, and with the initiation of Canadian manufacture the unfilfilled War Office orders were cancelled (22). It was still too early to begin the formation of anti-aircraft batteries to man the non-existent guns. During the eighteen months that were to elapse before Canadian AA guns came into production, the problem of provision of fire control equipment had to be met and solved.

PROVISION OF FIRE CONTROL EQUIPMENT

16. As the time approached for delivery of the first Canadian-produced anti-aircraft guns it was agreed, in November 1941, that in view of the UNITED KINGDOM'S urgent need for air defences, GREAT BRITAIN should share equally with CANADA in receiving the guns as they were completed (23). But PEARL HARBOUR brought into sharp focus the anti-aircraft needs of the PACIFIC Coast, and the War Office agreed to CANADA'S retention of the first 24 - 3.7" equipments produced (24). Predictors for these guns (Sperry No. 5 Mk. I) were being

manufactured in the UNITED STATES, for British and Canadian use. In order to ensure that placing the guns in operation would not be held up once they were delivered the release was authorized of six Sperry predictors to match the first 24 3.7" equipments allotted to CANADA (25). For the 40-mm Bofors Gun the Kerrison Predictor AA No 3 Mk II (US Director M 6) was adopted. The first six released to CANADA from UNITED STATES production were not received until July 1942, but by the end of the year deliveries were being made at the rate of twenty-five instruments per month.

ELECTRICAL METHODS OF FIRE CONTROL.

17. The use of RDF (radio direction finding) methods of fire control was first investigated by CANADA in the summer of 1939, when the DMA (Col NO CARR) visited BRITAIN and made a study of the employment of the new secret equipment (25). The GL (gun laying) sets were designed to give early warning of enemy aircraft approach. Range, height, and bearing readings were transmitted electrically by magslip into a predictor, which combined the data to determine future range, bearing and angle of sight for the use of the guns. The use of GL sets made it possible to range upon unseen targets without the aid of visual instruments (26).

18. Two GL sets were ordered from the War Office in October 1939, and delivered in the following August (27). Army personnel were sent to ENGLAND to take a course on the new equipment (28). Under the Chiefs of Staff Committee an interservice committee was formed, - the Electrical Methods of Fire Control Sub-Committee (29), and arrangements were made for the manufacture of GL equipment in CANADA. Incorporated under the Department of Munitions and Supply the firm of Research Enterprises Ltd was established at LEASIDE, Ontario (30), and orders were placed for enough GL sets to serve all heavy anti-aircraft guns on the ultimate Canadian Scale (31).

EMPLOYMENT OF ANTI-AIRCRAFT SEARCHLIGHTS

19. The introduction of electrical methods of fire control reduced the necessity for providing searchlights for AA defence at night. The Canadian General Staff wisely allowed itself to be guided by the experience gained by GREAT BRITAIN in the use of Searchlights, and for two years the policy of providing for equipment underwent periodic revision as new information from the UNITED KINGDOM became available. While the Army Plan in August 1940 showed an ultimate allotment of 222 lights to CANADA and NEWFOUNDLAND, with 30 of these assigned to the PACIFIC Coast (32), modifications in the extensive use of AA searchlights were being recommended by the War Office.

20. Experience had shown that lights could not be employed successfully with AA guns, and that their most effective use was in the provision of an Air Fighting Zone which illuminated enemy targets for attack by our own fighters (33). In August 1941 GREAT BRITAIN advised that only where fighter aircraft were available would AA Searchlights be used, to indicate enemy aircraft to the RAF. Where anti-aircraft defence alone was available, no lights would be in action (34).

21. A decision along these lines was reached in CANADA, and the ultimate scale of AA Searchlights was again revised (October 1941) to allot sixteen lights per fighter zone to the five areas where fighter squadrons of the RCAF were to operate. The one fighter zone on the West Coast was ESQUIMALT. In all

other anti-aircraft gun areas, GL sets without searchlights were to be used (35). The uncertainty that had existed during 1940 and 1941 about the future role of AA searchlights had resulted in orders to the manufacturers being withheld, so that of the 80 lights now required for the five fighter zones, there were on hand only 37 modern and five obsolescent equipments (36). These lights were all on the ATLANTIC Coast, whose defence needs were rated at a higher priority than those of the West Coast.

EQUIPMENT AT THE WEST COAST

22. During the first two years of war, while the General Staff was dealing with the anxious problem of the provision of guns and auxiliary equipment for anti-aircraft defences, on the PACIFIC Coast there was little for the Joint Services Committee to do along these lines but to assist in the making and revision of plans for the future disposition of such armament as was expected to become available (37). The prior claims of BRITAIN's own needs were fully understood, and, as long as JAPAN remained neutral, it was appreciated that CANADA's ATLANTIC Coast was more vulnerable to air attack than her West Coast. But the complete lack of any effective anti-aircraft defences for BRITISH COLUMBIA was clearly recognized, and it was apparent, if only to satisfy the uneasiness of public opinion, that in the distribution of the new production early priority should be given to the claims of the PACIFIC Command (38).

23. Eight weeks before PEARL HARBOUR CANADA's effective anti-aircraft defences still consisted of the four 3" 20-cwt pre-war guns, and the four 3.7" equipments received from the War Office late in 1939(39). The first of the Canadian-made Bofors was to come off the production line in a week, but difficulty in the manufacture of the Mk III mounting for the 3.7" equipments was to delay delivery of the heavier guns until March 1942 (40). Meanwhile, PACIFIC Command's sole AA defences, the two old 13-pdrs, sans ammunition, were being used to train personnel of the 2 AA Bty RCA at FORT MACAULAY (41). And in the Provincial ARP organizations the enrolment of volunteers was reaching the 30,000 mark (42)!

II THE OUTBREAK OF WAR WITH JAPAN

2 AA BTY MANS THE FIRST BOFORS

24. JAPAN's dramatic entry into the war brought rapid action in improving the West Coast anti-aircraft defences, - action that was as effective as CANADA's meagre resources would allow. The first three 40--mm Bofors guns produced in CANADA together with 6,000 rounds of ammunition were rushed from the factory to ESQUIMALT within a week of PEARL HARBOUR. Two of these were in place and manned for the defence of the Drydock before the end of the year (43), the third going to PATRICIA BAY early in January.

25. The only anti-aircraft unit on the PACIFIC Coast at this time was the 2 AA Bty RCA. During the first year of war details of the battery had been employed in manning the six-inch Coast Defence guns at FORT MACAULAY. In October 1941 authority was given to bring the battery to strength, using personnel trained at the Coast Defence and Anti-Aircraft Artillery Training Centre at HALIFAX, and "R" recruits from advanced artillery training centres. Organization was to be completed by March 1942. Although no guns were yet available, the battery was to be organized as Type H (4 3.7" guns) (44). But early in December the threat of impending hostilities

brought orders to concentrate the battery immediately at FORT RODD HILL. The two 13-pdrs were moved across from FORT MACAULAY to be remounted on concrete platforms at RODD HILL, ready for action whenever ammunition should become available. But the arrival of the three 40-mm guns from HAMILTON provided modern equipment to work with, and the battery took over the manning of the Bofors pending receipt of their 3.7" guns.

THE FIRST 3.7" GUNS

26. The increased urgency of the PACIFIC Coast's needs resulted in a decision to transfer from the ATLANTIC Coast half of the 3.7" four gun battery at HALIFAX. On 10 Jan 42 the movement took place of No 3 Sec 1 AA Bty RCA from HALIFAX to PATRICIA BAY, bringing two 3.7" guns and all equipment* (45). It was given the role of the defence of the important PATRICIA BAY Aerodrome. Known at first as the "Special (Heavy) Anti-Aircraft Section", the detachment later became the nucleus for the 9 AA Bty RCA on its formation in May 1942 (46).

1 AA MG TROOP

27. The third type of AA defence unit to move to the PACIFIC Coast appeared with the arrival of 1 AA MG Tp RCA from 14 AA Regt RCA, ARVIDA, Quebec, equipped with four .5-inch AA Browning machine guns. Moving to ESQUIMALT in December, the troop was first employed at PATRICIA BAY as defence against low level bombing attacks (47). Late in February two more Bofors, manned by a detachment of the 2 AA Bty, were released for the PATRICIA BAY Aerodrome, and the machine gun troop was withdrawn. One section (with two guns) was despatched to SEA ISLAND Airport, the other half of the troop remaining at RODD HILL to man positions at the ESQUIMALT Dry Dock (48).

SPECIAL SHRAPNEL SECTIONS RCA

28. While provision was thus being made to defend the RCAF Airfields at PATRICIA BAY and SEA ISLAND against attack by enemy aircraft, consideration had also been given to the protection of advanced seaplane bases at isolated outposts on the coasts of VANCOUVER ISLAND, the QUEEN CHARLOTTE ISLANDS, and the Northern Mainland. On 12 Dec 41 three Special Shrapnel Sections RCA, each consisting of an Officer and 19 other ranks drawn from Artillery Training Centres at BRANDON and SHILO, were mobilized on the Prairies, and were hastily moved to BRITISH COLUMBIA. Early in January they were in their positions at UCLUELET, ALLIFORD BAY, and BELLA BELLA (49). Two 75-mm Field Guns for each section provided interim protection against enemy submarines and motor launches, pending expected delivery of 40-mm Bofors guns. A fourth section was organized in February, and held at WORK POINT, ESQUIMALT, for relief purposes.

29. The Ultimate Scale of Bofors to be provided for the PACIFIC Coast had risen from four in March, 1939 (50), to 38 in January 1942, the increased allotment allowing for two guns at each of the advanced air bases. In due time enough 40-mm guns were released from manufacture to fill the requirements at these bases, and in June 1942 the shrapnel sections

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* One mobile 3.7" was turned over by A23 C & AAATC to the 1 AA Bty for this move. (War Diary Halifax Fortress d. 9 Jan 42) The four 3.7s remaining in operation at Halifax were on static mounts.

became sub-units of the 58 Special AA Bty RCA, a fifth section being formed for the defence of the RCAF base at COAL HARBOUR (51).

WAITING FOR THE GUNS

30. The spring of 1942 thus found the PACIFIC Command, while pitifully short of up-to-date anti-aircraft weapons, manning what few new guns were available, and supplementing these defences with substitute ground artillery weapons. No Canadian-made heavy AA guns had thus far been produced, but the 40-mm Bofors were beginning to trickle out to the Coast with promise of more satisfying quantities to follow. Had TOKYO decided during January or February to risk a carrier-borne air attack on such a profitable target as ESQUIMALT, the total defensive AA fire that VANCOUVER ISLAND could offer would have come from two 3.7" guns, three Bofors and four .5" machine guns sited at PATRICIA BAY and ESQUIMALT (52). The inadequacy of the defences is pointedly illustrated by a terse entry in the War Diary of the 2 AA Battery. "The Queen Elizabeth entered dry dock. $80,000,000 more in property for us to protect with our two guns" (53). Until the new guns came it was a matter of carrying on with not much more than token defences. But it was time to organize and train the personnel who were to man the long-awaited armament.

III MANNING THE EQUIPMENT

FORMATION OF AA UNITS

31. On 17 February 1942 the Privy Council approved the mobilization of anti-aircraft units "to cover all anti-aircraft equipment likely to be available to PACIFIC Command in 1942"(54). The units to be formed were made up of four AA Batteries, type "H", (the 9th, 21st, 22nd and 23rd), manning 4 3.7" guns each; one battery, type "2L" (the 13th), manning eight 40-mm Bofors; six AA troops, type "L", (the 10th, 11th, 31st, 32nd, 33rd and 34th), with four Bofors each; and five AA sections, type "L" (the 35th to the 39th), to replace the Special "Shrapnel" Sections at the Advanced Air Bases (see para 29).

32. This represented a tremendous increase in strength over the single battery already at the Coast (2 AA Bty, Type H, mobilized in Oct 41), but before any of the new units had passed beyond the training cadre stage the prospect of an increased scale of available armament resulted in the expansion by conversion of most of them into batteries of double or treble the size. At the same time (13 Apr 42) (55) the formation of four additional units was authorized, - the 42 AA Bty and 43 AA Bty, each type "2H"; the 44 AA Bty, Type "H"; and the 47 AA Troop, Type "L" (56).

ALLOCATION OF NEW UNITS

33. A revised ultimate scale of anti-aircraft defences issued by the General Staff in March 1942, showed provision being made for allotment to PACIFIC Command of 48 3.7" AA guns and 92 Bofors (57). The heavy guns were distributed for the defence of the large cities and airfields. (Later, in the spring of 1943, the policy was adopted of defending aerodromes with 40-mm Bofors instead of 3.7" guns). To man

these guns the newly-formed units were allocated as follows (58);-

Location	Ultimate Scale of 3.7" guns	Unit	Type	No. of guns Manned.
VICTORIA - ESQUIMALT	12 guns	2 AA Bty	(H)	4 guns
		42 AA Bty	(2H)	8 guns
PATRICIA BAY	8 guns	9 AA Bty	(2H)	8 guns
VANCOUVER - SEA ISLAND -		21 AA Bty	(2H)	8 guns
NEW WESTMINSTER	16 guns	43 AA Bty	(2H)	8 guns
PRINCE RUPERT	4 guns	22 AA Bty (to include ANNETTE IS.)	(2H)	8 guns
TOFINO	4 guns	23 AA Bty	(H)	4 guns
HARDY BAY	4 guns	44 AA Bty	(H)	4 guns

34. The new scale for the provision of Bofors guns in the PACIFIC Command more than doubled the scale visualized in January 1942. The increase allowed for improved light AA defences at vulnerable points and at RCAF airfields, and allotted two Bofors to each of six outlying coast batteries for their own anti-aircraft protection. The following table shows the allocation of the anti-aircraft batteries and troops that were to man the 40-mm guns (58):-

Location	Ultimate Scale of 40-mm guns	Unit	Type	No. of guns Manned.
VICTORIA - ESQUIMALT	12 guns	13 AA Bty	(3L)	12 guns
PATRICIA BAY	8 guns	10 AA Bty	(2L)	8 guns
SEA ISLAND	8 guns	11 AA Bty	(2L)	8 guns
VANCOUVER	12 guns	31 AA Bty	(3L)	12 guns
NEW WESTMINSTER	4 guns	47 AA Tp	(L)	4 guns
PRINCE RUPERT	8 guns	32 AA Bty	(2L)	8 guns
TOFINO	8 guns	33 AA Bty	(2L)	8 guns
HARDY BAY	8 guns	34 AA Bty	(2L)	8 guns
UCLUELET	2 guns	37 AA Sec *	(L)	2 guns
COAL HARBOUR	2 guns	38 AA Sec *	(L)	2 guns
BELLA BELLA	2 guns	39 AA Sec *	(L)	2 guns
ALLIFORD BAY	2 guns	35 AA Sec *	(L)	2 guns
(For Relief purposes)		36 AA Sec *	(L)	

* Sections of 58 Special AA Bty.

SOURCES OF AA PERSONNEL

35. In February 1942, when seeking ministerial approval of the formation of the new anti-aircraft units, the CGS made it plain that several months must elapse before such units could go into operation with their guns.

> "Approximately one month's time is required to produce the necessary cadre personnel, plus an additional six weeks for the training of cadres. Following completion of cadre training, a period of from five to six weeks is required for the concentration, organization, and preliminary unit training. There is, therefore, a period of from four to five months' time from the date of authorization until the unit is ready to move to its operational location where further unit training can proceed" (59).

36. Training facilities in CANADA for anti-aircraft units were extremely limited. The C and AA Artillery Training Centre at HALIFAX was fully occupied in training cadres for authorized units in ATLANTIC Command. PACIFIC Command was instructed as far as possible to provide instructional cadres from within its own resources (60). It was realized that the completion of so large a training programme could only be effected by progressive stages. Priority was given to training the personnel who were to man the 3.7" guns allotted to the PATRICIA BAY aerodrome and the VICTORIA - ESQUIMALT area. This placed the 9 AA Bty high on the list, and with it the three units who were taking over the Bofors temporarily manned by the 2 AA Bty at PATRICIA BAY, ESQUIMALT and SEA ISLAND, - the 10, 11 and 13 Btys (58). Close behind these in priority were placed the 22 AA Bty (Type 2H) and the 32 AA Bty (Type 2L), both earmarked for the defence of PRINCE RUPERT (61).

37. It was proposed that personnel for these cadres should be found from existing AA units of the PACIFIC Command, including the detachment of the 1 AA Battery (Type H) manning the two 3.7" equipments at PATRICIA BAY; from Coast Artillery Units of the Command; and from reinforcement personnel drawn from the C and AA Artillery Training Centre at HALIFAX, and from Advanced Artillery Training Centres at PETAWAWA, BRANDON and SHILO (60). But the only existing fully organized AA unit in the Command was the 2 AA Battery, which had never had any 3.7" equipment on which to train and whose cadre of officers and other ranks had had no training at the C & AA ATC. The detachment from 1 AA Battery was to form the nucleus of the high-priority 9 AA Bty, and was unable to provide personnel for cadres of other units. To make matters more difficult, coast artillery units in PACIFIC Command had been denuded of personnel for overseas formations to such an extent that experienced officers and other ranks were not available in the numbers required, - nor were many to be found with any training in AA artillery. In the circumstances it was apparent that cadres must be formed mainly from the third source, - the artillery training centres outside the Command (61).

38. But time was becoming more and more a deciding factor. The guns must be manned without delay, whether preliminary training cadres had been fully organized or not. The Artillery Training Centres and the C & AA ATC at HALIFAX were combed to provide drafts for PACIFIC Command. At the end of April the movement to the Coast took place of more than 500 other ranks, active and members HD, to be distributed among the six AA batteries on the list of first priority (62).

39. To meet the demands of this move, and of a corresponding draft of 1,000 men to AA units in ATLANTIC Command, every available artillery English-speaking member HD had been utilized, together with practically all personnel of Category B2 or C, or of undetermined category, as well as 128 Active reinforcements who had to be thus diverted temporarily from the stream for overseas. And there were increasingly large vacancies to be filled in the establishments of the AA units as the output of Bofors grew and the first 3.7" equipments came off the production line. Early in May the estimated number of total requirements of AA personnel for CANADA in the near future stood at more than 6,000 (63). Obviously the Artillery Training Centres could supply only a fraction of the men required. A proposal that certain newly organized under-strength AA units should use Reserve Army personnel on a part-time basis was turned down as not practicable (64). In the emergency it was found necessary to draw from Infantry Training Centres and from Basic TCs. As far as possible such personnel had completed at least one month's training, but in some cases "R" recruits coming directly "off the street" through depots, were posted (untrained) to units (63).

EARLY AA TRAINING IN PACIFIC COMMAND

40. The problem faced by the Training Staff of PACIFIC Command was a big one. Lack of equipment, a shortage of qualified instructors, and above all, limitations of time, made it impossible to follow the normal progressive procedure of training unit cadres prior to the concentration and organization of the whole battery. Often the unit's issue of Bofors guns arrived practically simultaneously with substantial incoming drafts of untrained "R" recruits, and all would be plunged immediately into an operational role (65).

41. Instruction in AA gunnery began in December 1941, with the arrival at ESQUIMALT of two qualified Bofors instructors from ENGLAND, - Capt RA GOUDEY RCA, (afterwards Lt-Col GOUDEY OC 27 AA Regt), and Sgt DC McHARG RCA. A school of instruction was immediately begun for personnel of the 2 AA Bty, who had just received the first three Bofors guns to reach the Command. The new equipment was employed in a dual operational and training role.

COAST ARTILLERY SCHOOL OF INSTRUCTION

42. On 10 Jan 42 A24 Coast and AA Artillery Training Centre that had operated at MACAULAY since May 1941, ceased to function (66). NDHQ had decided that economical use of instructors and equipment required all AA artillery reinforcements to be trained at one training centre, - A23 at HALIFAX. To replace A24, a small school, the Coast Artillery School of Instruction, was established at FORT MACAULAY with a staff of three officers and six NCOs (67). For the next eight months the CAS of I with its limited establishment was to bear the bulk of the burden of training unit cadres for the rapidly mobilizing AA batteries, both heavy and light, on PACIFIC Command.

43. During the early summer of 1942 the newly formed batteries sent, in order of priority, detachments of officers and NCOs to the CAS of I for courses of four weeks on Bofors,

and six weeks on the 3.7".guns. The inadequate establishment of the School made it necessary to improvise an AA Wing and to attach to the staff additional instructors and assistant instructors from units who could ill afford to spare them from their cadres. Many of the officers on the slates of the new batteries had had little or no artillery training, and must be given some training in AA artillery before proceeding to their units. With the impending arrival of a flood of untrained "R" recruits to fill the batteries the need for materially extending facilities at the CAS of I became urgent (68).

44. In August the establishment of the School was increased to 15 officers and 95 other ranks, to include an AA Wing to train 18 officers and 100 other ranks, and an additional temporary AA Wing to give 500 "R" recruits basic and AA artillery training (69). The first recruits reported from depots in the western military districts on 7 August, and continued to arrive in monthly batches of 500 to the end of the year (70). On completion of four weeks' training at the CAS of I the men were posted to AA units in the Command.

FORMATION OF AA REGTS

45. The need for grouping the newly formed units for administrative and operational control early became apparent. A CGS submission to the Minister in Mar 1942, seeking authority to form eight Headquarters of an AA Regiment made the following case:

> " The Headquarters of both the ATLANTIC and PACIFIC Commands are finding it increasingly difficult, as additional units are authorized, to deal directly with the vast amount of detail involved in the initial development of the AA Defences and the formation with subsequent administrative and operational control of the numerous AA units. As a result, the GO'sC-in-C, ATLANTIC and PACIFIC Commands, have recommended, that the AA Defences of their respective Commands be grouped, where feasible, into regimental areas, and that decentralized control be made possible by the provision of a Headquarters of an AA Regiment for each regimental area (71)."

46. Of the eight AA regiments whose formation in CANADA was approved, two were authorized for PACIFIC Command. HQ 27 AA Regt was established at ESQUIMALT, to administer the batteries of the VICTORIA-ESQUIMALT - PATRICIA BAY area. HQ 28 AA Regt at VANCOUVER was to be responsible for the VANCOUVER - SEA ISLAND - NEW WESTMINSTER area. The effective date of organization was 1 Jun 42 (72). When this regimental grouping was being planned earlier in the year, it had been considered that for smaller areas, such as PRINCE RUPERT or TOFINO, the formation of a Regiment was not necessary, and that the AA units in these places, both of heavy type and light, could be grouped under the OC Heavy Battery (73).

VICTORIA-ESQUIMALT - 27 AA REGT RCA

47. On 26 Jun 42 Lt-Col RA GOUDEY (see para 41 above) (74) assumed the command of the newly organized 27 AA Regiment, establishing his headquarters at MACAULAY and becoming responsible for the administration of all the AA units in the south-east corner of VANCOUVER ISLAND (83).

The 2 AA Bty (type H), the first battery on the coast (see para 25 above), had handed over the Bofors guns it had been temporarily using, and was now at MACAULAY manning four 3.7" guns newly arrived from the factory for the AA defence of ESQUIMALT-VICTORIA. At FORT RODD HILL the 42 AA Bty (Type 2H), low on the list of priority for the organization of units was in training while awaiting the issue of its heavy guns (75). By the end of the year the battery was manning four 3.7s at COLWOOD (76), and in April 1943 Battery HQ moved to that site from RODD HILL (77). The battery took over its second operational site at TILLICUM, in July 1943, to complete with the 2 AA Bty the manning of the twelve 3.7" guns assigned to VICTORIA and ESQUIMALT (78). The three four-gun sites formed a triangle in the centre of which lay the chief vulnerable point - the Drydock in ESQUIMALT Harbour. The 13 AA Bty (Type 3L) was in July manning eight 40 mm Bofors guns (increased to twelve by the end of the year), which were mounted singly at various strategic points along the ESQUIMALT-VICTORIA waterfront and on the high ground above the two harbours (79).

48. North of VICTORIA two anti-aircraft batteries were guarding the important PATRICIA BAY air station. The 9 AA Bty (Type 2H) was manning four 3.7" guns, (of which two were the original pair rushed out from HALIFAX in January). By October the number had grown to eight, (with the battery occupying sites at Wilson Road and BAZAN BAY, respectively north and south-east of the airfield (80). Defence against low-flying aircraft was furnished by the 10 AA Bty, manning Bofors. To provide the four-gun density considered necessary for the protection of a vulnerable area of PATRICIA BAY's importance, the number of Bofors allotted had been increased to twelve, and the 10 AA Bty was converted from Type 2L to Type 3L to man the additional guns (81). The remaining unit of the 27 AA Regt was the 1 AA (MG) Troop, brought from ARVIDA at the end of 1941 (see para 27 above) and now giving additional protection to the ESQUIMALT Drydock with two .5" Browning Machine Guns manned at RODD HILL and two at PARSON's BRIDGE (82).

VANCOUVER - 28 AA REGT RCA

49. HQ 28 AA Regt RCA, was established at VANCOUVER Barracks, on 26 Jun 42, with Lt-Col WHG LAMBERT as Commanding Officer (83). The newly formed regiment comprised the two heavy and the three light batteries allocated for the AA defence of the VANCOUVER - SEA ISLAND - NEW WESTMINSTER area (see para 34 above). The end of June found the 11 AA Bty (Type 2L) at SEA ISLAND manning its eight Bofors (84), and the 31 AA Bty (Type 3L) in VANCOUVER preparing to establish gunsites along the industrial waterfront and at the North VANCOUVER ship building yards (85). The remaining units of the new regiment, the 21 AA Bty (Type 2H), the 43 AA Bty (Type 2H) and the 47 AA Troop (Type L), were still at ESQUIMALT, very much under strength and in the formative stage, undergoing training at MACAULAY CAMP (86).

50. With RCAF fighter and bomber squadrons operating from SEA ISLAND and BOUNDARY BAY, the GOC-in-C, early in July decided that the disposition of AA defences in the area should be based upon the defence of these two aerodromes (87). Accordingly all AA guns in the area, except four 3.7" guns at VANCOUVER Harbour, were allocated to the SEA ISLAND and BOUNDARY BAY stations. The removal of all Bofors from VANCOUVER solved the somewhat difficult problem of selecting sites for the limited number of guns available in an industrial area that had many targets of

relatively equal status but none of outstanding importance (88). The new disposition sent the 21 AA Bty (Type 2H) to BOUNDARY BAY early in September, and the 43 AA Bty (Type 2H) to SEA ISLAND. By the end of the year each of the two heavy batteries had received half of its allotment of 3.7s, but it was not until April 1943 that the full complement of guns had been mounted, with the 21 Bty manning eight at BOUNDARY BAY, and the 43 Bty manning four at SEA ISLAND and four in VANCOUVER (Ambleside)(89).

51. The new disposition of defences provided the two airfields on the Mainland with the same amount of protection against low-flying craft as had been given the PATRICIA BAY Station, - twelve Bofors each. To meet these requirements the 31 AA Bty (Type 3L) was reallocated from VANCOUVER to BOUNDARY BAY (90), and the 11 AA Bty (Type 2L) at SEA ISLAND was converted to a Type 3L battery, absorbing the personnel of the 47 AA Troop, which was disbanded (91). By the middle of October all twenty-four Bofors were in action (92).

52. The following table shows the rearrangement that had taken place in the allocation of anti-aircraft equipments for the VANCOUVER Defences and the batteries assigned to man them (91):-

Location	Former Allotment		New Allotment	
	3.7"(Bty)	40mm(Bty)	3.7"(Bty)	40mm(Bty)
VANCOUVER	16 (21&43)	12(31)	4 (43)	-
SEA ISLAND AERODROME	-	8(11)	4 (43)	12 (11)
NEW WESTMINSTER	-	4(47)	-	-
BOUNDARY BAY AERODROME	-	-	8 (21)	12 (31)

The new disposition was to hold reasonably firm until the reorganization of the AA Regiments in July 1943.

ADVANCED AIRBASES - 58 SPEC AA BTY

53. Out at the advanced air bases at ALLIFORD BAY, BELLA BELLA, COAL HARBOUR and UCLUELET, the five Special Shrapnel Sections, RCA, manning their 75-mm field guns in an anti-ship role, had been redesignated as Independent AA Sections, with the establishment of each increased to two officers and 44 other ranks (See para 29 above) (93). The long awaited Bofors arrived during the summer, and by September were in action in an AA defence role at each of the four bases (94). In order to relieve these small isolated units of some of the burden of administrative detail particularly with regard to the accounting of Ordnance and Armament Stores, a battery headquarters was organized, to be responsible for the training and administration of the five sections (95). HQ 58 Special AA Bty RCA (Capt G FANNING, OC), was established at ESQUIMALT in June 1942, moving to HASTINGS PARK, VANCOUVER, in December (96), assuming control, under the Colonel Fixed Defences, of 35-39 AA Sections RCA. For a year the battery headquarters administered the five AA sections, keeping four at the air stations and one relief section on leave or in training. In July 1943, when reorganization of AA defences in the Command took place, HQ 58 Spec AA Bty and 37, 38 AA Sections were disbanded. The remaining three sections of the battery were expanded to form 35, 36 and 39 AA Tps (Type L), passing under the control of the 29 and 30 AA Regts (97).

PRINCE RUPERT - 29 AA REGT

54. The strategic importance of PRINCE RUPERT had placed high on the list of priority of mobilization the two AA batteries allocated to that city's defence (see para 36 above). But the shortage of available personnel and the limited training facilities in the Command made it early apparent that it would be late in the summer of 1942 before the two units could be ready to assume an operational role. Early in June, however, the Japanese attack on Dutch Harbour precipitated action in many an operational plan at the Coast, and on 9 June the 32 AA Battery moved to PRINCE RUPERT from its MACAULAY training camp. The next day it took on strength fifty-two non-gunners from the 1 Bn Edmonton Fusiliers, "with only thirty days' training, and with mumps", as the battery diarist reproachfully observed (98). The 22 AA Bty reached the northern port on 11 Sep 42, in time to get four 3.7" guns im action by mid-October.

55. But the pioneers in providing the anti-aircraft defences of PRINCE RUPERT were the men and guns of the 112 Light AA Bty, of LETHBRIDGE, a sub unit of the 6 Light AA Regt of the 4 Division. "G" Troop of this battery, comprising 3 officers and 81 other ranks, arrived at the northern terminal early in March, and at once began constructing gunsites for the Bofors that were on the way from the factory. By the end of April they had six guns in position along the waterfront and out at the RCAF seaplane base at SEAL COVE, with the allotment of eight being completed in May (99). On 10 June the rest of the battery (4 officers and 108 ORs), with Maj RW PHIPPS in command, arrived from PETAWAWA bringing six Bofors with them. "G" troop, ever the pioneers, went up to ANNETTE ISLAND (see para 63 below), and for six weeks the light battery manned the eight guns at PRINCE RUPERT before handing them over to the newly organized 32 AA Battery (100). From early June until the arrival of the 22 AA Bty in September Maj PHIPPS retained command of the AA defences of PRINCE RUPERT and ANNETTE ISLAND. During the remainder of their stay at the West Coast the 112 LAA Bty provided detachments for the Bofors guns at the coastal batteries at BARRETT and FAIRVIEW FORTS, as well as supplying personnel to man the four AA guns on No 1 Armoured Train operating between TERRACE and PRINCE RUPERT (101). By the middle of September, with other batteries light and heavy beginning to arrive in the area, their emergency role of filling the breach in the northern anti-aircraft defences came to an end, and with their companion battery from the 6 LAA Regt, the 30 LAA Bty, who had been performing similar duties on VANCOUVER ISLAND, they returned to PETAWAWA, en route for overseas (102).

56. For the next nine months the 32 AA Bty (Type 2L) and the 22 AA Bty (Type 2H) provided PRINCE RUPERT's inner AA defences. The ultimate allotment of 3.7-inch guns for the Northern defences had been increased in July from four to eight, to allow for placing four guns on ANNETTE ISLAND. To man the additional guns the 22 AA Battery had been converted into a Type 2H (103), and one troop manned their guns om ANNETTE ISLAND from September 1942 to the following May (see para 64 below). The site chosen for the four PRINCE RUPERT 3.7" guns was on high ground on 11th Avenue at the south-centre of the city. Put into action in October 1942, it was by far the most easily constructed of the sites that were later to complete the city's heavy AA defences.

57. An important change in the policy of allotment of heavy AA guns in CANADA came in January, 1943, when the Chiefs of Staff Committee, acting on British experience in active

theatres of operations, reached the conclusion "that better value would be obtained in the AA defence of CANADA generally by withdrawing the heavy AA defence against high level bombing from areas of secondary importance where only one 3.7" battery has been located, and using the guns withdrawn to strengthen the defence of larger areas whose present allotment is only eight or twelve guns". The factors whose consideration led to this decision were as follows:

(a) "High-level bombing is usually carried out only against big targets.

(b) Only sporadic bombing raids are presently envisaged in this country.

(c) It may be assumed that only a limited load of bombs can be carried for purposes of a raid on this country.

(d) Spot bombing is not customarily carried out from high altitudes.

(e) 3.7" AA guns cannot effectively engage aircraft carrying out low level or dive bombing attacks.

(f) Nothing less than an eight-gun density (equal to sixteen guns at least) is likely to produce lethal results against high level bombing. Four guns have not even deterrent value against a determined pilot." (104).

58. In PACIFIC Command the new decision meant the withdrawal of the heavy batteries guarding or allocated to the airfields at ANNETTE ISLAND, TOFINO and PORT HARDY. It was not difficult to find new roles for them. Revisions of the Ultimate Scale of Allotment of AA guns made by the Chiefs of Staff Committee in March and again in May 1943 had increased PRINCE RUPERT's quota of 3.7" guns to twelve, and now assigned twenty-four heavy guns to the VANCOUVER Area (105). On 12 May "B" Troop of the 22 AA Bty returned from ANNETTE ISLAND to join the parent battery at PRINCE RUPERT (106). From TOFINO the 23 AA Bty (Type H) went in mid-April to VANCOUVER (107), later to be increased to a Type 2H battery as part of a reorganized 28 AA Regt. PORT HARDY never saw its heavy battery. Organized in June 1942 for service at the North VANCOUVER ISLAND airfield, the 44 AA Bty (Type H) had spent nine months at ESQUIMALT gradually building up its strength towards war establishment. The changed policy sent the battery to PRINCE RUPERT in July 1943, after spending four uncertain months at HASTINGS PARK, VANCOUVER (108).

59. By the middle of 1943 the increase in the number of units providing the AA defences of PRINCE RUPERT led to the organization of the 29 AA Regt RCA to administer all AA batteries and sub-units in Northern BRITISH COLUMBIA (109). Regimental Headquarters was set up in PRINCE RUPERT on 5 Jul 43 (110). Lt-Col GF PAULIN, ED, came from Brigade Major, ESQUIMALT Fortress, to become the first Commanding Officer. Second in Command was Maj AD MORRIS, who, as OC 22 AA Bty (Type 2H), had been OC PRINCE RUPERT AA Defences during the preceding ten months. The new regiment comprised the following units:-

HQ 29 AA Regt	PRINCE RUPERT
22 AA Bty (Type 2H)	PRINCE RUPERT
44 AA Bty (Type H)	PRINCE RUPERT

HQ 32 AA Bty (Type 3L)	PRINCE RUPERT
34 AA Bty (Type 2L)	ANNETTE ISLAND
35 AA Tp (Type L)	ALLIFORD BAY
62 AA Tp (Type LS)	WHITEHORSE
9 AA GOR	PRINCE RUPERT

60. Throughout the summer of 1943 the men of the two heavy batteries toiled at the tremendous task of carving their gunsites out of the northern muskeg. "B" Troop 22 AA Bty on their return from ANNETTE ISLAND (see para 58 above) went to work at TOBEY POINT on DIGBY ISLAND, due west of PRINCE RUPERT (111). Across the harbour, four miles to the north-west of the city, the 44 AA Bty pitched their tents and began construction at PILLSBURY COVE (112). To move the guns and equipment into position it was necessary at both sites to build a plank road on log trestles and corduroy for a distance of some five hundred yards up from the beach. Gravel, rock and shale for the gun foundations had to be hauled up by truck from the beach at low tide. Ten feet of rock went in under the guns. By mid-September, when the 9 AA Bty from PATRICIA BAY relieved the 22 AA Bty, the sites were sufficiently far advanced for all guns to be in action, and PRINCE RUPERT's ultimate allotment of twelve 3.7's had been filled (113).

61. The same considerations that had raised the allotment of heavy guns to the northern city brought about an increase in her defences against low-flying attack. A Chiefs of Staff Committee decision in March 1943 recommended that the number of Bofors provided for the city be raised to twelve "in view of the importance of PRINCE RUPERT to US - ALASKAN activities and the assumption by CANADA of responsibility for the AA defences of the port" (114). To meet the change the 32 AA Bty was converted from Type 2L to Type 3L (115). By the end of 1943 the twelve Bofors were in action along the PRINCE RUPERT waterfront and at SEAL COVE, manned by 11 AA Bty (Type 3L) which had relieved the 32 AA Bty in September.

ANNETTE ISLAND

62. The story of CANADA's provision of anti-aircraft defences on the UNITED STATES owned ANNETTE ISLAND in South-Eastern ALASKA may be considered as starting with a meeting that took place on 6 Mar 42 at Headquarters 13th Naval District SEATTLE, attended by the Commanders of the UNITED STATES and CANADIAN Services on the PACIFIC Coast. At the meeting, which was held to consider the whole problem of defence on the West Coast, the Air Officer Commanding, Western Air Command, stressing the necessity for fighter-aircraft to protect the increasingly important base of PRINCE RUPERT, put forward the suggestion of stationing a RCAF fighter squadron on ANNETTE ISLAND. Units of the UNITED STATES Army Air Corps could not be spared for service in South Eastern ALASKA, the Western defences at KODIAK and DUTCH HARBOUR demanding a much higher degree of priority (116). The suggestion became a recommendation of the Permanent Joint Board on Defence, and on 27 Apr 42 the 115 Fighter Squadron RCAF landed on the island, to be reinforced by the 118 Fighter Squadron at the end of June (117).

63. First anti-aircraft defences for ANNETTE ISLAND were provided by "G" Tp 112 Light AA Bty which moved in by instalments with six 40-mm guns between 1 June and 20 June (See para 55 above). By the end of July the remainder of the battery, less detachments at the PRINCE RUPERT forts, had followed "G" Troop to the island. During July and August the Battery constructed permanent sites for the ultimate allotment

of eight Bofors, built the necessary roads to these sites, and selected positions for the 3.7" guns that were to come in with the 22 AA Bty (118). Accommodation for the Canadian troops was provided by the US Army, and consisted of half-round (Quonset) huts as living-quarters for personnel, with recreation rooms, kitchens, dining rooms etc constructed of lumber (119). For rations they were attached to the RCAF. During the battery's stay at ANNETTE relations with the RCAF and the US Army and Air Corps were of the most cordial nature (120), and their departure brought from the US garrison commander a commendation for their "soldierly conduct and general deportment while stationed at that command" (121).

64. On 11 Sep 42 the 34 AA Bty (Type 2L) relieved the 112 LAA Bty at ANNETTE ISLAND, and at the same time "B" Troop of the 22 AA Bty (Type 2H) arrived to man the four 3.7" gun positions (122). The 34 AA Bty was originally slated for employment at HARDY BAY (see para 34 above), but the delay in completion of the airfield there, and the need for releasing the 112 LAA Bty for movement overseas led to the change of allocation (123). Like many another unit on the PACIFIC Coast in 1942 the battery entered its first operational role with the minimum of training. Formed at ESQUIMALT in July, the battery had, by the end of August acquired a strength of only 6 officers and 36 other ranks out of an establishment of 7 and 167. Before leaving for the north the numbers were increased by the 45 recruits who had spent a month at the CAS of I (124), but for the majority of the battery's personnel training came during the year they spent manning their lonely Bofors in the unattractive climate of ANNETTE ISLAND (125). Their companions at the heavy gunsites, the 22 AA Bty, stayed only seven months. The decision to withdraw 3.7" defences from outlying airfields (see para 58 above) resulted in the troop's withdrawal to PRINCE RUPERT early in May 1943, to put their guns in action at TOBEY POINT (126).

65. The removal of the heavy guns left the eight Bofors of the 34 AA Bty providing ANNETTE ISLAND's sole AA defence. But the strategic role of the island was rapidly changing. By early fall the RCAF was preparing to vacate the Alaskan island in favour of TERRACE on the mainland. Landing strips had been completed at MASSETT and SANDSPIT in the QUEEN CHARLOTTE Islands, and the combination of better weather and advanced runways was calculated to give as effective air coverage from TERRACE as from ANNETTE ISLAND (127). On 6 Oct 43 the 34 AA Bty was withdrawn to VANCOUVER, to be disbanded by the end of the year (128). Its place at ANNETTE ISLAND was taken for a short time by the 31 AA Bty (Type 2L) but on 16 November the RCAF left for the island for TERRACE, and at the end of the month the 31 Bty was moved to PATRICIA BAY, leaving ANNETTE to its American owners (129).

66. The despatch of the 34 AA Bty and the 22 AA Bty to ANNETTE ISLAND in September 1942, marked the first employment of NRMA personnel or Members HD of the Canadian Army in an operational role outside of CANADA. Special governmental authorization was given in Order-in-Council PC 7995, dated 4 Sep 42, which permitted despatch of NRMA personnel in three AA batteries "for service and duty in the territory of ALASKA" (130). Named with the 22 and 34 AA Batteries but not sent was the 32 AA Bty. (The 112 LAA Bty which served in ALASKA was composed of General Service personnel). Before the 34 Battery was relieved at ANNETTE ISLAND a further Order-in-Council, PC 3238, of 20 Apr 43, extended the provisions of the previous order to include any reinforcements, both artillery and infantry, that might be sent to ALASKA.

WHITEHORSE - 62 AA TROOP

67. Under 29 AA Regt for administration was the 62 AA Tp (LS), a unit organized in March 1943 on a special establishment to provide anti-aircraft defence at WHITEHORSE, YT(131). When Maj-Gen PEARKES, GOC-in-C, Pacific Command, attended the official opening of the ALASKA HIGHWAY in the previous November, the US Commander, Brig-Gen JA O'CONNOR, Commanding NW Service Command, had urged the desirability of increasing the Canadian defence forces at WHITEHORSE (which then consisted of No 9 Aerodrome Defence Company). The Big WHITEHORSE aerodrome formed a strategic link in the chain of communications to ALASKA. At the end of 1942 the city was the base for an extensive oil pipe-line construction programme, and an enormous quantity of material had been assembled. The proximity of WHITEHORSE to the Coast, less than 100 miles, made it an inviting target to Japanese air attack (132). As a result of Gen PEARKES' recommendations the 62 AA Tp, after a brief period of organization and training at HASTINGS, was despatched via SKAGWAY to WHITEHORSE. The six Bofors were in action by 29 Jun. During the two months the Troop remained at WHITEHORSE, they were attached to the North West Service Command of the US Army for quarters and rations and for medical and dental service. The reduction of ATTU and the impending campaign against KISKA lessened the Japanese threat through the ALEUTIANS, and on 11 Aug 43 the troop was withdrawn to VANCOUVER, where disbandment took place on 30 Sep 43 (133).

NORTH VANCOUVER ISLAND - 30 AA REGT RCA

68. On 4 Oct 40 the newly formed Permanent Joint Board on Defence in making its First Report to the President of the UNITED STATES and to the Government of CANADA recommended among certain defence measures to be taken by the Canadian Government independently, and as soon as possible, the provision of "an aerodrome at the north end of VANCOUVER ISLAND" so as to permit the operation of defending aircraft therefrom" (134). A month later, informally making its Eleventh Recommendation, the Board advised the construction of another aerodrome at UCLUELET for the following purposes:

> "(a) To extend the operational ranges and areas of fighter aircraft and provide more advanced defence to our vulnerable positions.
>
> (b) To provide bomber and fighter support to the north aerodromes and towards the QUEEN CHARLOTTE ISLANDS and the West Coast up towards PRINCE RUPERT.
>
> (c) To provide an alternative landing place for bombers and fighters in a very variable weather area." (135)

69. As a result of reconnaissance and detailed survey following these recommendations, construction was started at HARDY BAY at the north end of VANCOUVER ISLAND, and at TOFINO in the west, some fifteen miles up the coast from UCLUELET. The tremendous task of carving these airfields out of the dense timber proceeded steadily, with priority being given to the TOFINO station, and by August 1942, work on one runway was sufficiently near completion to allow its use by operational aircraft (137). On 4 July a force consisting of the 30 Light AA Bty RCA supported by a rifle company and a section of carriers from the Dufferin and Haldimand Rifles was detailed for the defence of TOFINO

Aerodrome. In command of the force was the OC 30 LAA Bty, Major Conn SMYTHE MC (136).

70. The 30 LAA Bty, of TORONTO, a component unit of the 6 Lt AA Regt RCA of the 4 Division, had been brought to the PACIFIC Coast from PETAWAWA early in June, and had been employed in manning Bofors at the heavy coastal batteries at ESQUIMALT and at YORK ISLAND (138). Throughout July and August they maintained their guard at TOFINO with eight Bofors disposed to meet dive-bombing threats or attempted use of the landing strips by enemy aircraft, as well as possible attack from the sea by small water-borne craft (136). On 9 Sep 42 they were relieved by the 33 AA Bty (Type 2L) RCA, which arrived at TOFINO simultaneously with a heavy battery, the 23 AA Bty (Type H) RCA.

71. In accordance with the previously decided policy of grouping anti-aircraft units for administrative purposes (see para 46 above) the command of the AA defences of the TOFINO-UCLUELET area now passed to the officer commanding the heavy battery, Maj AA RANSOM (later 2 i/c 27 AA Regt RCA). Both the 23rd and the 33rd Batteries had been mobilized to fill the role they were now occupying (see paras 33 and 34 above) and had undergone a short period of organization and training at MACAULAY. The 23 AA Bty, with its four 3.7" guns all in action by the end of October (139) did not stay long at TOFINO. The withdrawal of heavy AA defences from outlying airfields sent the battery to VANCOUVER on 18 Apr 43 (see para 58 above), and by the beginning of June its four guns were in action at POINT GREY (139). But its companion battery remained longer at TOFINO. Except for a four months' break in the spring of 1943, when it was relieved by the 59 AA Bty for a tour of duty and training at MACAULAY, the 33 AA Bty was destined to remain continuously on the West Coast of VANCOUVER ISLAND.

72. In June 1943, when regimental groupings of AA units in PACIFIC Command were undergoing revision, authority was granted for the organization of the 30 AA Regt RCA, to administer the anti-aircraft defences of the northern and western areas of VANCOUVER ISLAND (140). Under the command of Lt-Col KB JENCKES, formerly OC of the disbanded 9 Lt AA Regt RCA, Headquarters was set up at PORT ALBERNI on 3 Jul 43, the new regiment comprising the following sub-units(141):-

HQ 30 AA Regt RCA	PORT ALBERNI
33 AA Bty (Type 4L)	TOFINO and UCLUELET
59 AA Bty (Type 3L)	PORT HARDY and COAL HARBOUR
36 AA Tp (Type L)	COMOX
39 AA Tp (Type L)	BELLA BELLA

73. The organization of the 30 AA Regt coincided with the disbandment of HQ 58 Special AA Bty, which for a year had administered the scattered anti-aircraft sections at the advanced air bases (see para 53 above). These sections were either expanded to AA troops (Type L), e.g. 35 AA Tp at ALLIFORD BAY and the 39 AA Tp at BELLA BELLA, or absorbed into existing batteries, as was the case with the sections at UCLUELET and COAL HARBOUR. The 33 AA Bty jumped from Type 2L to Type 4L in order to take over the four-gun-assignment of the 37 AA Section at UCLUELET, and to man the AA defences at TOFINO now increased to twelve Bofors. The 59 AA Bty, formed in Oct 42 as Type 2L to replace at HARDY BAY the 34 AA Bty which had gone to ANNETTE ISLAND (142), was converted to a Type 3L battery when it absorbed the 38 AA Sec at COAL HARBOUR and took over its guns. The battery

entered upon its operational role at PORT HARDY on 16 Oct 43, putting eight Bofors into action (143). Shortly afterwards the COAL HARBOUR positions were closed down, and at the end of October the battery reverted to Type 2L (144).

74. The 30 AA Regt was short-lived. The period of expansion of anti-aircraft defences on VANCOUVER ISLAND was almost over, and there was little for a regimental headquarters to do. The two anti-aircraft batteries administered their outlying detachments at UCLUELET and COAL HARBOUR, and the 36 AA Tp, converted from the 36 AA Sec of the 58 Spec AA Bty, and slated for COMOX was disbanded without reaching its destination. In October all forces in North VANCOUVER ISLAND were placed under command of the OC Kent Regt at TOFINO (145), and the executive authority of the AA Regimental Headquarters was thus further reduced (146). At the end of the year HQ 30 AA Regt was disbanded, and the 33 AA Bty and the 59 AA Bty reverted to independent status in the AA defences of North VANCOUVER ISLAND (147).

AA DEFENCE OF CD BATTERIES

75. In addition to planning anti-aircraft defences for vulnerable points at centres of population, and for airfields and seaplane bases, it was necessary to provide protection from air attack for the important coast defence batteries which guarded the approaches to the defended ports of BRITISH COLUMBIA. Low level attack rather than high altitude spot bombing was to be expected on such relatively small targets, and allocation was made of two Bofors 40-mm guns to each of the seven counter-bombardment batteries in the PACIFIC Command (148). For the first two and a half years of war the establishment of coastal batteries had included AA LMG numbers (149), though guns were lacking, and after PEARL HARBOUR the outlying Coast Artillery Searchlight detachments at VANCOUVER and VICTORIA-ESQUIMALT were issued with a dozen Bren guns for their AA protection (150). The decision to provide Bofors added to the establishment of each of the batteries affected a light AA section consisting of one officer and 21 other ranks (151). Until the new 40-mm guns were available, two .303 inch AA LMGs (Bren) were allowed as an interim measure of protection (152).

76. While the revised was establishments referred to above carried effective dates of 1 May 42 and 1 Jun 42, provision of personnel for the new AA sections was not immediately authorized by NDHQ (153). When authority was issued no personnel were available to form the sections (154). To fill the gap the 30 LAA Bty, of the 6 LAA Regt RCA, was moved from PETAWAWA to VANCOUVER ISLAND early in June, and by the end of the month the battery was furnishing detachments manning two Bofors each at the MARY HILL, ALBERT HEAD and CHRISTOPHER POINT forts outside ESQUIMALT, and at YORKE ISLAND in JOHNSTONE STRAITS (155). Up at PRINCE RUPERT detachments of the 112 LAA Bty were performing similar duties with the heavy coastal batteries at BARRETT and FAIRVIEW (see para 55 above). At POINT GREY, the remaining counter-bombardment battery in PACIFIC Command, it was decided that because of VANCOUVER's comparatively protected location provision of 40 mm guns was not necessary (156), and the original allotment of two Bofors and the inclusion of a manning section in the coast battery's establishment were cancelled (157).

77. When the two batteries of the 6 Lt AA Regt left the PACIFIC Coast (see para 55 above) manning of the Bofors was taken over by the coastal batteries as guns and personnel became available (158). By the middle of November all twelve guns were being manned at the six forts (159). A year later, when the manpower situation was effecting restrictions upon the strengths of static coastal units, the light AA sections were dropped from the battery establishments, although the Bofors guns remained at their sites for use in emergency (160). Where the necessary gun crews would have come from in such a case was left to the ingenuity of the commander of the local coastal battery (161).

MOBILE AA ARTILLERY - 9 LAA REGT RCA

78. The move of the 6 Division to the PACIFIC Coast in the late summer of 1942 brought from PETAWAWA, where it had completed concentration (162), the divisional anti-aircraft regiment, the 9 Lt AA Regt RCA. Component batteries were the 25, 46, 48 and 79, mobilized respectively at OTTAWA, SIMCOE, Ont., WATFORD, Ont, and MONTREAL, representing four Military Districts. Under the command of Lt-Col KB JENCKES (later OC 30 AA Regt RCA) the regiment arrived in VANCOUVER on 7 Oct 42, and continued training at HASTINGS PARK for the remainder of the year. In January 1943 the regiment moved from VANCOUVER, with the exception of 79 Bty, which remained at HASTINGS PARK. The 25 Bty went to PORT ALBERNI, the 46 Bty to NANAIMO, and the 48 Bty to TERRACE, to form the mobile AA suport for the three brigade groups of the 6 Div (163). Regimental HQ was established at Work Point Barracks, VICTORIA, from which point the Commanding Officer exercised control of the training of his scattered batteries (164). In March 1943 the 33 AA Bty (Type 2L) and the 44 AA Bty (Type H), both temporarily at ESQUIMALT, came under command of the 9 LAA Regt (165).

79. As administration of the 25, 46 and 48 LAA Batteries passed more and more completely to the Infantry Brigade Groups to whom they were attached, it became no longer practicable to maintain a regimental headquarters. In June HQ 9 LAA Regt was disbanded (166). Lt-Col JENCKES assumed command of the newly formed 30 AA Regt, retaining the majority of the personnel of the old HQ 9 AA Regt to fill the establishment of the new headquarters (167). The 79 LAA Bty was reorganized from its mobile status to 79 AA Bty (Type 2L) and slated for employment at TERRACE under HQ 29 Regt. Before it got to its new station AA defence of the TERRACE airfield was abandoned, and the 79 Bty was disbanded on 1 Nov 43 (168).

80. The remaining three batteries of the 9 LAA Regt attained independent status. The 46 LAA Bty, serving with the 13 Inf Bde Gp, participated in the KISKA operation (June 43 to Jan 44). With one troop of four Bofors assigned to each of the three combat teams that participated in the occupation, the role of the battery was to provide defence against strafing aircraft during the landing. Later, during the five months that the Canadians stayed on KISKA, the guns of the battery formed an important part of the anti-aircraft defence of the whole island (169). Upon its return to CANADA the battery was reorganized with three troops of six guns each, as had already been the case with the 48 and 25 LAA Batteries, attached to the 14 and 15 Inf Bde Gps respectively (170). As the brigades moved in rotation to the various operational and training camps of the Command, - NANAIMO, PORT ALBERNI, COURTENAY, TERRACE and WAINWRIGHT, the mobile

batteries accompanied them participating in the training exercises and schemes that might some day lead to actual operational activity.

IV THE COMPLETION OF EXPANSION

ULTIMATE SCALE OF GUNS IN ACTION (i) 3.7"

81. By the end of 1943 shipment of AA guns and equipment authorized for PACIFIC Command had been almost completed. Whereas in May 1942 there had only been eight 3.7" and a dozen 40-mm guns at the Coast, December 1943 found 56 heavy guns and 142 Bofors manned. Fourteen heavy anti-aircraft sites for the defence of VPs in the major populated areas had been selected during 1943 upon the recommendation of Maj-Gen SCM ARCHIBALD, DGAA. A troop of a heavy battery manned each of the sites, which were allocated on the basis of two to PATRICIA BAY (see para 48 above), three each to PRINCE RUPERT (para 60) and VICTORIA-ESQUIMALT (para 47) and six to VANCOUVER. The allocation to VANCOUVER of the TOFINO 3.7" guns in April 1943 (see para 58 above) had made possible an extension and reorganization of that city's heavy AA defences. The BOUNDARY BAY heavy battery was brought with its eight guns into the city to give VANCOUVER a total of 24 3.7" guns. The six sites selected formed a double triangle about the city, and each of the heavy batteries in the area assumed manning duties at two of the positions. At the end of the year dispositions were as follows:-

21 AA Bty (Type 2H)	AMBLESIDE and POINT GREY
23 AA Bty (Type 2H)	LULU ISLAND and LITTLE MOUNTAIN
42 AA Bty (Type 2H)	LYNMUIR and BURNABY (171).

ULTIMATE SCALE OF GUNS IN ACTION (ii) 40 mm

82. The disbandment or cancellation of anti-aircraft batteries for WHITEHORSE, ANNETTE ISLAND, COAL HARBOUR, COMOX, TERRACE and No 1 Armoured Train left the Command at the end of 1943 with no shortage of Bofors guns. With possible scales of attack on the down-grade, and the manpower situation becoming increasingly difficult, it was possible that further reductions in the manning of AA defences would have to be made. The completion of the ultimate scale found Bofors in action at vulnerable points in industrial areas and at outlying airfields and sea plane bases. They were dispersed as follows: VANCOUVER (including SEA ISLAND and BOUNDARY BAY) 24 guns; VICTORIA-ESQUIMALT, 14; PATRICIA BAY, 12; PRINCE RUPERT (including the RCAF bases at SEAL COVE and ALLIFORD BAY) 16; TOFINO and UCLUELET, 16; PORT HARDY and BELLA BELLA, 12. In addition two Bofors were manned by Coast Artillery personnel at each of six Coast Battery sites (see para above), while the three mobile independent AA batteries had received 36 of their total allotment of 54 guns (172).

AUXILIARY AA EQUIPMENT

83. The extent to which the four 3.7" guns of a heavy AA battery could be said to be in a fully operational role was limited by the nature of the fire control instruments in use at the gunsites. For every four guns a Predictor (Sperry No.5) was provided, - an ingenious instrument into which was fed the data regarding the movement of the approaching target, and from which magslip cables transmitted

to the guns the target's future angle of sight, bearing and range. To obtain the necessary information for the Predictor, Height and Range Finders could be employed when targets were visible. But the more modern method of detection of planes, seen or unseen, and one that gave earlier warning and more accurate fire-control data, was the use of radar or GL sets (see para 17 above). The GL Mk IIIc set consisted of a ZPI (Zone Position Indicator) sweeping over a full 360 degrees and giving first warning of approaching planes at 60,000 yards range, and an APF (Accurate position Finder) which then pin-pointed the target by means of a concentrated beam reaching out 17,000 yards. If the target were to be engaged magslip cables carried the data into the Predictor for transmission to the guns.

84. The methods then by which heavy batteries could engage targets were dependent upon the fire control instruments as follows:-

(a) When neither Height and Range Finders nor GL sets were available, batteries could only engage by firing concentrations.

(b) With H & RF or GL sets in use seen targets could be engaged.

(c) The employment of GL sets made the engagement of unseen targets possible, i.e. the battery was fully operational (173). By the end of 1943 the gunsites of the fourteen heavy AA troops in the Command were each equipped with a Sperry Predictor; six had complete GL equipment, and the remaining eight were still employing Height and Range Finders (174). Another year was to elapse before sufficient radar equipment became available to make all heavy AA Batteries in the Command fully operational (175).

85. Fire control equipment for Bofors guns, which were always employed for the purpose of engaging visible, low-flying targets, consisted of the Kerrison No 3 Predictor, normally allotted on the basis of one per gun. In alternative use to the Predictor was the British-designed Stiffkey Stick (Sc Mark V), which had the advantage of speed in operation against unexpected targets though it lacked the Predictor's accuracy of fire control (176). The Stiffkey Stick's mobility in contrast to the weight of the Kerrison Predictor had proved the instrument's value during its employment by the 46 LAA Bty amid the transportation difficulties of KISKA. The end of 1943 found Kerrison Predictors in operation with the majority of the Bofors guns at the larger defended areas, while Stiffkey Sticks were supplementing Predictors at the advanced field and air bases, and were being used by the three mobile LAA batteries (174). By the middle of 1944 every 40-mm gun at an operational site in PACIFIC Command was equipped with both a Kerrison Predictor and a Stiffkey Stick (177).

AA GUN OPERATION ROOMS

86. The work of anti-aircraft control being carried on in the Gun Operation Rooms in the Command was given increased efficiency by the installation of radar equipment at the heavy AA Gunsites. The establishment of these GORs at the three main defence centres had followed closely upon regimental grouping of the various AA units in the area. No 2 AA GOR (27 AA Regt) was formed at ESQUIMALT in August

1942 (178), organization of No 6 AA GOR (28 AA Regt) at VANCOUVER followed within two months (179), and No 9 AA GOR (29 AA Regt) set up in PRINCE RUPERT in July 1943 (180).

87. Functioning in close liaison with RCAF Operational Headquarters in each locality, the GOR was the nerve centre of all anti-aircraft defences in the area. Into the GOR came all information available regarding the movement of planes in the vicinity, forwarded by the RCAF Operations Controller, sent in as ZPI and APF on "plots" from the AA gunsites. All such information was displayed on large charts and location maps in the GOR. The Gun Duty Officer was then responsible for the selection and passing of pertinent information to the AA defences, or to the other services (181). In the case of enemy attack it was from the GOR that the AA Defence Commander or his representative would fight his batteries.

4 AA S/L BTY

88. The employment of anti-aircraft searchlights did not reach an advanced stage at the PACIFIC Coast. After a considerable amount of fluctuation in establishing a firm policy largely due to conflicting reports from Overseas, it was decided, in October 1941, to allot lights only to the five fighter zones in CANADA where RCAF fighter squadrons were to operate (see para 21 above). To furnish the lights for the RCAF Squadron allocated to ESQUIMALT, the 4 AA Searchlight Bty RCA was formed at VICTORIA on 1 Jan 42 (182). Maj AA RANSOM, later 2 i/c 27 AA Regt, was the Commanding Officer. Three officers and 15 NCOs drawn from the 17 S/L (CD) Bty, the 3 S/L (CD) Bty and other CD batteries, attended a six weeks' course of instruction at A23 C&AA Artillery Training Centre at HALIFAX, returning to the West Coast in mid-February to act as a training cadre. Five obsolescent 120 cm searchlights and Leyland-Westinghouse generating plants were used for training in exposure for spotting and illuminating aircraft, the 111 Army Co-operation Sqn RCAF supplying a Lysander for this purpose (183).

89. But the man-power situation was presenting a difficult problem, and operational policies were still changing. At the end of April 1942 the battery, which had reached a strength of only 2 officers and 40 other ranks out of an establishment of 7 and 220 (184) was disbanded (185). Maj RANSOM became OC the newly-organized 23 AA Bty (Type H), and took the personnel of the disbanded battery with him (186).

ACCOMMODATION

90. It was not to be expected that the expansion from one to nearly thirty anti-aircraft units in PACIFIC Command could be accomplished in a little over a year without serious accommodation problems arising, particularly when during the same period infantry forces at the coast were being increased from six to twenty battalions and corresponding changes in strength were occurring with other branches of the service. For the earlier authorized batteries at VANCOUVER and in the VICTORIA-ESQUIMALT-PATRICIA BAY area, it was possible to plan accommodation and select sites before units were ready to move to their operational positions (187) but in many cases lack of materials held up construction until late in the autumn, and the winter of 1942-43 found the Bofors units at PATRICIA BAY, SEA ISLAND and BOUNDARY BAY still quartered in marquees and bell tents (188). Continually

damp bedding and clothing brought a high incidence of colds (189). Although life amid the cool humidity of a BRITISH COLUMBIA winter, in tents that boasted neither walls, floor boards, nor stoves, might be considered a normal and unavoidable condition of active service, the fact that the RCAF personnel on the same station were accommodated in quarters that appeared luxurious by army standards was not conducive to high morale among the neighbouring AA gunners (190).

91. Further afield conditions varied. Sections of the 58 Special AA Bty at the advanced seaplane bases had no accommodation worries when they were attached to the RCAF for quarters and rations, while the Canadian batteries that went to ANNETTE ISLAND lived in Quonsit huts provided by the US authorities. But the early anti-aircraft units into TOFINO carried their tents with them (191), and canvas accommodation remained the order of the day for most of the first winter (192). And few units worked harder to get suitable accommodation than the two heavy AA batteries at PRINCE RUPERT who lived in tents at TOBEY POINT and PILLSBURY COVE while they carved themselves a campsite out of the muskeg and heavy bush (193).

92. Throughout 1943 PACIFIC Command Engineer Services and civilian construction companies gradually caught up with the demand for accommodation, and by the end of the year huts for living quarters and gunshelters for AA Crews on duty had been provided at all operational sites (194).

OPERATIONAL TRAINING AND PRACTICE SHOOTS

93. One of the most serious training problems confronting commanders of AA units in an operational role was the difficulty, which in many cases amounted to a near impossibility - of obtaining facilities for practice shoots for their guns. While each regiment was empowered to call upon a neighbouring RCAF station to supply a towing plane and drogue, experience showed that weather conditions and other factors proved insuperable obstacles. War Diaries of AA batteries carry with almost monotonous regularity such entries as "Practice shoot arranged for today called off at last moment by RCAF" (195). The poor flying conditions that generally prevailed in the PRINCE RUPERT district placed AA units stationed there at a distinct disadvantage in the matter of practice firing, for up until the end of February 1944 only one battery shoot was held, when a Bolingbroke was supplied from TERRACE (193).

94. With no plane-towed targets to shoot at, batteries found other means of expending their accumulating stocks of practice ammunition. Firing into an empty sky, while providing necessary exercise in gun drill, failed to give the satisfaction that comes from a well hit mark, and in some cases targets were supplied by the use of hydrogen-filled balloons (196). The psychological need for regular firing practices is illustrated by an entry in the War Diary of a battery stationed at ANNETTE ISLAND:

> " Weather still bright and clear. Took advantage of it to carry out a seaward shoot in the afternoon. Fired 154 rounds of ammo at floating trees, rocks and reefs. Not much laying practice, but made all ranks appreciate they were still Artillery, and let them hear what a gun sounded like. Crash action and mobile drill provided a pleasant interlude from a static role." (197).

95. To remedy the condition that allowed AA units so few opportunities for firing, and to give all batteries a period of intensive training, free from camp construction and other non-operational duries that later occupied so much of their attention, two Command Practice Camps were instituted in August 1943. The camp for heavy AA artillery was established at VICTORIA HEIGHTS on MACAULAY POINT, ESQUIMALT (198) while the LAA Practice Camp was placed at BOUNDARY BAY (199). Attendance at the camps followed a schedule designed to agree with the NDHQ policy of moving all units at least once a year.

96. The HAA Practice Camp at MACAULAY accommodated one troop at a time for a three weeks' period, while the other troop of a Type 2H battery would be in readiness at COLWOOD, manning the guns there. A similar rotation took place at the BOUNDARY BAY Practice Camp, where half the battery manned the VP guns while the other half carried out intensive gunnery training over a period of two weeks. One major drawback to this rotation between regiments, from an administrative viewpoint, was the fact that regimental headquarters would periodically find their batteries divorced from them during the practice period, with new units coming temporarily under their command. But the alternative plan, that of having practice camps within each regimental area, was precluded by the unsuitable weather conditions at PRINCE RUPERT, as well as the limited amount of air cooperation available.

RESTRICTIONS, REDUCTIONS AND REORGANIZATION

97. The late summer of 1943 saw the reaching of the peak of expansion in AA defence on the West Coast. The occupation of ATTU and KISKA in May and August removed the threat of a Japanese drive up the Aleutian Chain, and enemy naval reverses elsewhere in the PACIFIC materially lessened the danger of aerial attack on BRITISH COLUMBIA from carrier-based planes. The defeat of Axis forces in North AFRICA and SICILY together with the increasing success of Russian forces against the main German armies had removed the possibility of any major threat against the East Coast of NORTH AMERICA. In the light of the general improvement in the strategical picture and to meet the increased demand for overseas reinforcements, it was necessary to effect substantial reductions in the strength of operational troops in CANADA (200).

98. From 1 Oct 43 manning strengths of all static AA units in CANADA were reduced on a scale of 20 per cent for Heavy, and 5 per cent for light batteries. This meant a reduction of 28 gunners per heavy troop, and 3 gunners per light troop, and resulted in a saving of 474 men. In the batteries affected in PACIFIC Command (201). Revision of the establishments of the three AA GORs in the Command, eased the manpower situation by providing for the inclusion of CWAC personnel as operators (202).

99. Accompanying these restrictions came further withdrawals from operational sites. In November the eight 3.7" guns at PATRICIA BAY were taken out of action, and the 22 AA Bty (Type 2H) manning them was converted to 22 HAA (Mob) Bty. The battery began training in a mobile role, preparing for participation in any future operation undertaken by one of the three brigade groups of the 6 Div. At the same time the 12 Bofors at BOUNDARY BAY were withdrawn from their static role, to be used in training and allotted for emergency operations in VANCOUVER. To man these guns two reserve field batteries, the 201 and 202 (R) Fd Btys of the 39 (R) Bde Gp were reorganized and began training as LAA (R) Btys (203).

100. Air strength on the PACIFIC Coast began to decrease early in 1944 as demands were met for its employment in more imperative roles (204). The requirements in AA defence of airfields and seaplane bases correspondingly declined. By July 1944 AA defences at TOFINO, UCLUELET, BELLA BELLA, PORT HARDY and ALLIFORD BAY had become non-operational, and, apart from the mobile batteries in training, all AA units in the Command were centred at VANCOUVER, VICTORIA-ESQUIMALT and PRINCE RUPERT (205).