

strength of the Fighter force which should be employed. Sector Commanders detailed the Fighter Units to be employed, and operated the machinery of Interception.

76. Various states of preparedness were laid down, *e.g.*, Released, Available (20 minutes), Readiness (5 minutes), and stand-by (2 minutes), and Sectors reported all changes to Group Headquarters, where an up-to-date picture of the state of affairs was recorded by lights on the walls of the Operations Room. Various liaison officers from the Observer Corps, guns and searchlights were maintained in Group and Sector Operations Rooms.

77. It will be seen that the Sector Commander had on his table the best available information as to the position and track of an enemy formation; but, in order to effect an accurate interception, it was necessary that he should also know the position and track of his own Fighters.

78. This was recorded by means of R/T D/F (Radio Telephony Direction Finding). R/T signals were transmitted automatically for 15 seconds out of each minute by selected Fighter aircraft and were picked up by two or three D/F stations installed in Sectors for the purpose. The readings were passed by direct telephone lines to Sector Headquarters, and a mechanical plotting device gave an almost instantaneous plot of the Fighter's position.

79. In the more recently organised Sectors these D/F stations had not been installed, and it was necessary to keep track of the Fighters by giving them precise orders as to speed and direction, and plotting their tracks by Dead Reckoning. This method was adequate only if the force and direction of the wind at various altitudes could be correctly estimated.

80. The Sector Commander could thus see on his operations tables the positions and courses of enemy formations and of his own Fighters, and was enabled so to direct the latter as to make interceptions with the former in a good percentage of occasions by day. Interception depended, of course, on the Fighters being able to see the enemy, and, although the system worked adequately against enemy formations in daylight, the degree of accuracy obtainable was insufficient to effect interception against night raiders not illuminated by Searchlights, or against individual aircraft using cloud cover by day.

81. Orders were given to pilots in their aircraft by means of a very simple code which could be easily memorised. For instance "Scramble" meant Take off. "Orbit" meant Circle. "Vector 230" meant Fly on a course of 230 Degrees.

82. I realised that the enemy might pick up the signals and interpret them, but any elaborate code was out of the question if it included reference to some written list in the air.

83. As a matter of fact the enemy did pick up and interpret the signals in some cases, but not much harm was done, except when they were able to discover the height at which a formation was ordered to operate, and the time when it was ordered to leave its patrol line and land.

84. "Pancake" was the signal for the latter operation, and I therefore introduced several synonyms, the significance of which was not obvious to the enemy.

85. The code word for height was "Angels," followed by the number of thousands of feet; when it appeared probable that the enemy were taking advantage of this information I introduced a false quantity into the code signal. Thus "Angels 18" really meant Fly at 21,000 and not 18,000. On more than one occasion German Fighter formations arriving to dive on one of our patrols were themselves attacked from above.

86. The system as a whole had been built up by successive steps over a period of about four years, and I was not dissatisfied with the way in which it stood the test of war.

87. The steps taken to devise a system of night Interception are described later in this Despatch.

88. I must now give a brief account of the characteristics of the aircraft commonly employed on both sides. As regards the Fighter types available in the Command, the bulk of the force consisted of Hurricanes and Spitfires; the former were beginning to be outmoded by their German counterparts. They were comparatively slow and their performance and manoeuvrability were somewhat inadequate at altitudes above 20,000 ft. The Spitfires were equal or superior to anything which the Germans possessed at the beginning of the Battle.

89. The Hurricanes and Spitfires had bullet-proof windscreens and front armour between the top of the engine and the windscreen. They also had rear armour directly behind the pilot, which was previously prepared and fitted as soon as we began to meet the German Fighters. The early adoption of armour gave us an initial advantage over the Germans, but they were quick to imitate our methods. While German aircraft remained unarmoured, I think it is now generally agreed that the single-seater multi-gun fighter with fixed guns was the most efficient type which could have been produced for day fighting. With the advent of armour some change in armament and/or tactics became necessary, and the subject is discussed in more detail in Appendix F.

90. The Defiant, after some striking initial successes, proved to be too expensive in use against Fighters and was relegated to night work and to the attack of unescorted Bombers.

91. The Blenheim was also unsuitable for day-time combat with Fighters, owing to its low speed and lack of manoeuvrability. It had been relegated to night duties for these reasons, and because adequate space was available in its fuselage for an extra operator and the scientific apparatus which was necessary for the development of a new night-interception technique. The cockpit had not been designed for night flying and the night view was extremely bad. Its already low performance had been further reduced by certain external fittings which were essential for the operation of the Radio Detecting apparatus.

92. The Beaufighter was looked on as a Blenheim replacement in which most of the above disadvantages would be overcome. Its speed promised to be adequate and its armament consisted of 4 20-mm. Cannons instead