The action of the defence achieved success in the following ways:—

(*a*) The actual destruction or disablement of enemy aircraft (see Appendix "C").

(*b*) The breaking up of formations, thus enabling the R.A.F. to press home attacks on smaller groups of bombers.

(*c*) Destroying the accuracy of their bombing by forcing the enemy aircraft to take avoiding action.

(*d*) By pointing out to patrolling fighters the whereabouts of enemy formations by means of shell bursts.

The following methods of fire were in operation at this period:—

(a) *Seen Targets.*

(i) Each gun site was allotted a zone of priority and responsibility for opening fire on a target rested with the G.P.O.

(ii) Targets could be engaged by day if identified as hostile beyond reasonable doubt or if a hostile act was committed. By night, failure to give recognition signals was an additional proviso.

(iii) It was the responsibility of the G.P.O. to cease fire when fighters closed to the attack.

(b) *Unseen Targets.*

Unseen firing at this time was in its infancy and considerable initiative was displayed in evolving methods for engaging targets unseen by day or by night.

The following methods were employed:—

(i) *Geographic Barrages.*

Many forms of barrage were used by different G.D.As. but all were based on obtaining concentrations at a point, on a line, or over an area, through which the enemy aircraft must fly.

Suitable barrages for lines of approach and heights were worked out beforehand. Approach of enemy aircraft was observed by G.L. and, by co-ordination at G.O.Rs., the fire from each site could be controlled to bring a maximum concentration of shell bursts at the required point.

(ii) *Precision Engagements.*

Method A.—Due to poor visibility or wrong speed settings searchlight intersections were often made without actual illumination of the aircraft. By obtaining slant range from G.L. and following the intersection on the Predictor, sufficient data were available to enable shells to burst at or near the intersection.

Method B.—This provided for engagement without searchlight intersections. Continuous bearings and slant ranges from the G.L. were fed into the Predictor and engagement of target undertaken on the data thus provided. For sites which were not equipped with G.L. the appropriate information was passed down from G.O.R.

It will be appreciated that procedure varied with different Gun Zones, according to circumstances and the equipment available. It should be remembered that all engagements of unseen targets were subject to the express permission of the Group Controller at Uxbridge, so that danger of engaging friendly aircraft was obviated.

(c) *Anti-Dive-Bombing Barrage.*

Special barrages against dive bombers were organised round the following V.Ps.: Harwich Harbour, Thameshaven Oil Installations, Tilbury Docks, Chatham Dockyard, Sheerness Dockyard, Dover Harbour, Purfleet Oil and Ammunition Depots.

This barrage could be employed at any time at the discretion of the G.P.O. when he considered that other and more accurate methods were unlikely to be effective. The barrage was designed for a height of 3,000 feet and assumed a dive angle of 60°. It was based on a barrage circle round each gun site which was divided into 4 quadrants in which the barrages were placed.

The maximum effort from H.A.A. guns was required from the 19th August to the 5th October, during which time the crews had little rest, continuous 24 hours manning being required at Dover, a "duty gun station" system being worked in all areas.

Evidence is available to show how time and time again enemy bombers would not face up to the heavy and accurate fire put up by gun stations. Particularly worthy of mention are two attacks on Hornchurch aerodrome when on both occasions fighters were on the ground for refuelling. A.A. fire broke up the formation and prevented *any damage to the station* buildings and aircraft on the ground.

4. *Part played by L.A.A. Guns.*

The targets which offered themselves to L.A.A. guns were in the main small numbers engaged in dive bombing or low level attacks on V.Ps. Opportunity usually only offered fleeting targets, and quickness of thought and action was essential to make fullest use of the targets which presented themselves.

Success against targets by L.A.A. guns was achieved in the following ways:—

(*a*) The destruction or disablement of enemy aircraft (See Appendix "C").

(*b*) The prevention of accurate bombing causing the bombers to pull out of their dive earlier than they intended.

Methods of firing employed by L.A.A. guns as follows:—

(i) *Bofors.*

Fire was directed either by No. 3 Predictor or by Forward area Sights; some Bofors were not equipped with the Predictor when the latter method only could be used.

The Predictor equipped guns require a 130 Volt A.C. electric supply which was provided either from engine-driven generators or from the mains. Shooting with the Predictor achieved very great accuracy and the results and destruction of aircraft and the average ammunition expenditure proved the efficiency of this equipment (see Appendix "C"). The F.A.S. method permitted quick engagements of targets although without the accuracy afforded by the Predictor.

(ii) 3-*inch* 20-*cwt. Guns* (*Case* I).

Some V.Ps. were equipped with the 3-inch 20-cwt. gun without Predictor which was fired from deflection sights; shrapnel was normally used. H.E., however, was used for targets at greater height.

(iii) *A.A.L.M.G.*

Lewis Guns on A.A. mountings proved extremely effective in attacking low-flying enemy aircraft. These guns were mounted in single, double or quadruple mountings and were fired by the Hosepipe method using tracer ammunition.